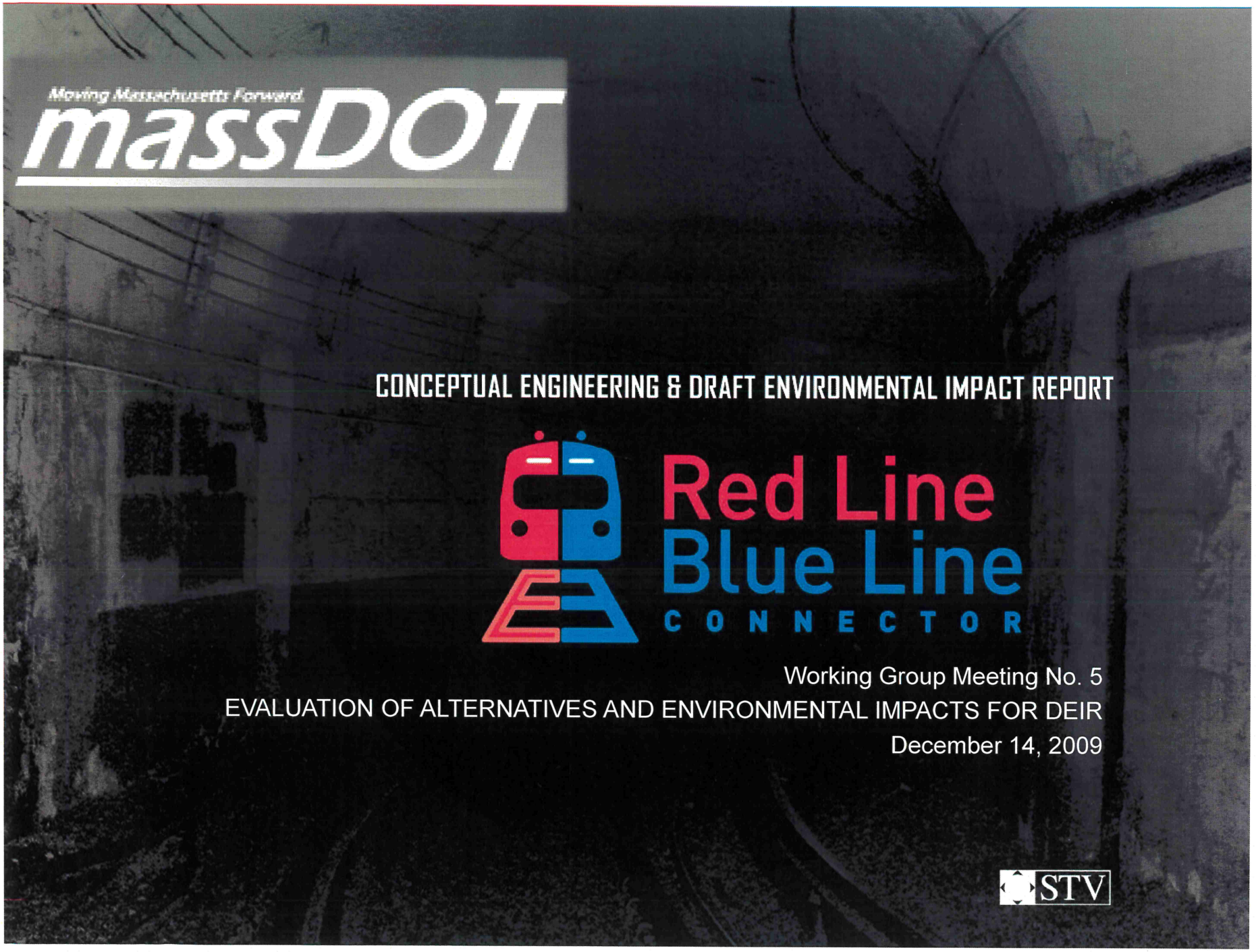
Moving Massachusetts Forward
massDOT
CONCEPTUAL ENGINEERING & DRAFT ENVIRONMENTAL IMPACT REPORT
Red Line
Blue Line
CONNECTOR
Working Group Meeting No. 5
EVALUATION OF ALTERNATIVES AND ENVIRONMENTAL IMPACTS FOR DEIR
December 14, 2009
STV

Presentation Outline

1. Introductions and Guidelines Review
2. Presentation of Ridership Modeling Results
3. Preview of the Draft Environmental Impact Report
4. Capital Improvements
5. Station Egress
6. Power, Signals and Communications
7. Public Comment
8. Next Meeting

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RED-BLUE CONNETOR STUDY
RESULTS OF THE TRAVEL DEMAND ANALYSIS

Presented by Scott Peterson

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Manager of the Transportation Systems Analysis Group

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CTPS Discussion Points

- Modeling Tool
- Performance Measures
- Existing Conditions Analysis
- Scenarios Examined - Assumptions
- Future Year Assumptions
- No-build Analysis
- Build Analysis
- Comparison of No-build and Build Scenario
  - *Transit*
  - *Highway and Air Quality*
  - *Other*
- Questions & Answers

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Modeling Tool

A computerized tool developed specifically for the metro Boston area and refined with input from FTA, FHWA and EPA.

- Utilizes various local survey data, census data, and transit/traffic counts.
- Regional model – covers eastern Massachusetts
- Base year calibrated to existing data
- Future year consistent with the Long Rang Transportation Plan
- Pivots off of the standard 5-step modeling process
- Used in the Green Line DEIR, North Shore DEIR Update, Urban Ring RDEIR, Silver Line Phase III New Starts.
- Tool is based on numerous assumptions, but provides an unbiased and consistent methodology to analyze alternatives that have changes in the transportation network.

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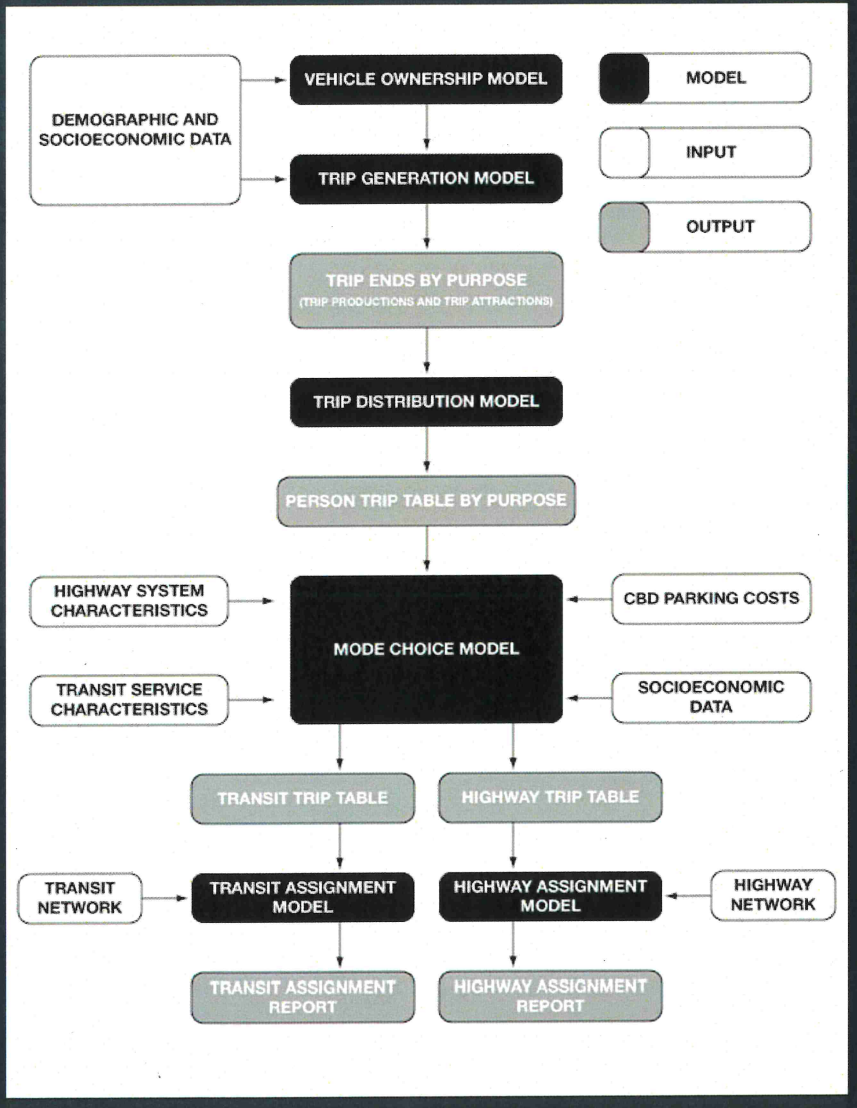
5-Step Process



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Performance Measures

Transit

- Linked transit trips (transit, auto, and walk)
- Unlinked transit trips (boardings)
- Transfer activity (to/from what RTL)
- Peak Loads (where it occurs/how it changes)

Highway

- Traffic volumes by time period on major roadways
- Congested speeds on major roadways

Air Quality

- NOx, VOC, CO, & CO2

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Existing Conditions Analysis

System Wide Statistics – 2008 Avg. Weekday

Total Linked Transit Trips = 945,800

Total Unlinked Transit Trips = 1,295,800

- Commuter Rail Ridership = 123,100
- Rapid Transit Rider Ship = 784,300

  Blue Line = 64,500 Green Line = 288,200

  Red Line = 242,900 Orange Line = 182,100
- Silver Line (BRT) = 25,700
- MBTA/RTA Buses = 358,300
- Ferry Service 4,400

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Existing Blue Line Analysis

Blue Line

- FY Annual Unlinked 16,346,400
- Avg. Daily Boardings = 64,550
- Highest Inbound Daily Boardings = Maverick
- Highest Outbound Daily Boardings = Govt Ctr
- Station with highest number of daily transfers = Govt Ctr
- Station with the highest number of drive trips = Wonderland
- 65% who start their trip on the Blue Line exit at a Blue Line Station
- 10% who start their trip on the Blue Line exit at a Red Line Station
- 17% who start their trip on the Blue Line exit at a Green Line Station

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Existing Red Line Analysis

2008 Red Line

- FY Annual Unlinked = 68,560,600
- Avg. Daily Boardings = 242,900
- Highest Inbound Daily Boardings = Harvard
- Highest Outbound Daily Boardings = Park St
- Charles/MGH Daily Boardings = 9,840
- Station with highest number of daily transfers = Park St
- Station with the highest number of drive trips = Quincy Adams
- 78% who start their trip on the Red Line exit at a Red Line Station
- 15% who start their trip on the Red Line exit at a Green Line Station
- 6% who start their trip on the Red Line exit at a Orange Line Station

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Scenarios Examined

Service Characteristics

Line	Peak Period (min.)	
Station to Station Data Provided	Headway	Run Time
2008 Base - Blue Line: Wonderland to Bowdoin	5	20
2030 No-build - Blue Line: Wonderland to Bowdoin	5	20
2030 Alt 1. - Blue Line: Wonderland to Charles/MGH no Bowdoin	5	22
2030 Alt 2. - Blue Line: Wonderland to Charles/MGH	5	24

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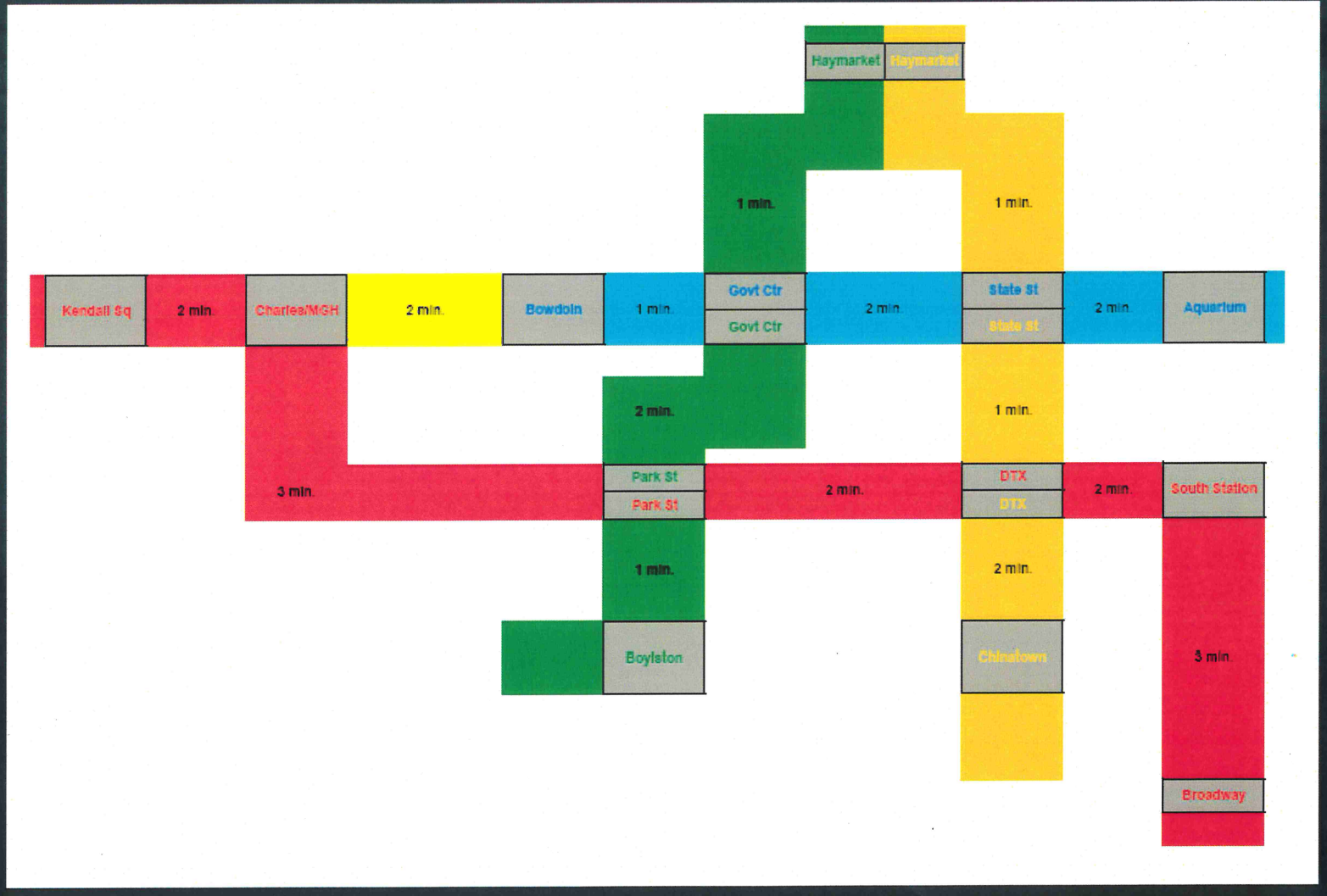
Scenarios Examined - Network Connectivity



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Future Year Land Use Assumptions

TAZ	Employment		Population	
	2000	2030	2000	2030
1	909	937	622	646
2	4,300	7,300	252	706
3	5,307	5,489	51	865
4	2,267	3,156	1	1,206
21	1,665	1,640	3,343	4,072
22	14,358	14,232	-	24
23	179	2,154	28	40
24	1,259	2,170	238	248
25	209	196	2,005	2,013
27	248	239	2,480	2,547
28	607	587	2,118	2,126
29	2,355	2,300	87	116
30	900	876	1,112	1,117
31	1,458	1,425	147	160
32	3,083	3,018	42	66
33	3,418	3,348	3	13
34	1,846	1,799	388	764
35	5,410	5,286	-	24
36	6,080	6,036	406	478
Study Area	55,857	62,188	13,323	17,231

Source: 2007 Adopted Land Use from MAPC

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Future Year Transportation Assumptions

Source: Projects included in the most current Boston MPO Regional Transportation Plan (RTP)

Transit Projects

- Green Line Extension to Medford
- Fairmount Commuter Rail Additional Stations
- SIP Parking Expansions and Wonderland Parking Expansion
- Excludes – Urban Ring Phase 2, Silver Line Phase III, and Blue Line to Lynn

Highway Projects

- Please refer to the RTP

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No-Build Analysis

System Wide Statistics – 2030 Avg. Weekday

Total Linked Transit Trips = 1,085,600

Total Unlinked Transit Trips = 1,501,400

- Commuter Rail Ridership = 154,800
- Rapid Transit Rider Ship = 868,200

Blue Line = 73,000 Green Line = 337,200

Red Line = 252,600 Orange Line = 198,500

- Silver Line (BRT) = 60,500
- MBTA/RTA Buses – 412,700
- Ferry Service 5,200

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No-Build Growth Analysis

Growth from 2008 to 2030

Linked Transit Trips Increase by 9%

Unlinked Transit Trips Increase by 12%

Commuter Rail Increases by 23%

Blue Line Increase by 13%

Red Line Increases by 4%

Green Line Increase by 17%

Vehicle Miles of Travel Increase by 17%

Average Travel Time Increases by 6%

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Build 1 Analysis

System Wide Statistics – 2030 Avg. Weekday

Total Linked Transit Trips = 1,086,200

Total Unlinked Transit Trips = 1,497,100

- Commuter Rail Ridership = 154,700
- Rapid Transit Rider Ship = 864,400

Blue Line = 77,200 Green Line = 331,100

Red Line = 250,600 Orange Line = 198,600

- Silver Line (BRT) = 60,500
- MBTA/RTA Buses – 412,300
- Ferry Service 5,200

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Comparison Build 1

Commuter Rail = 100 people shift from North Shore Commuter Rail to Blue Line

Rapid Transit = There are 3,800 fewer unlinked transit trips

Blue Line = Boardings increase by 4,200

Red Line = Boardings decrease by 2,000

Green Line = Boardings decrease by 6,100

Orange Line = Boardings increase by 100

MBTA/RTA Buses = Boardings decrease by 400

Total unlinked transit trips decrease by 4,300

Total linked transit trips increase by 600

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Build 2 Analysis

System Wide Statistics – 2030 Avg. Weekday

Total Linked Transit Trips = 1,086,100

Total Unlinked Transit Trips = 1,497,200

- Commuter Rail Ridership = 154,700
- Rapid Transit Rider Ship = 864,500

Blue Line = 77,400 Green Line = 331,300

Red Line = 250,400 Orange Line = 198,500

- Silver Line (BRT) = 60,500
- MBTA/RTA Buses – 412,300
- Ferry Service 5,200

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Comparison Build 2

Commuter Rail = 100 people shift from North Shore Commuter Rail to Blue Line

Rapid Transit = There are 3,700 fewer unlinked transit trips

Blue Line = Boardings increase by 4,400

Red Line = Boardings decrease by 2,200

Green Line = Boardings decrease by 5,900

Orange Line = No change in boardings

MBTA/RTA Buses = Boardings decrease by 400

Total unlinked transit trips decrease by 4,200

Total linked transit trips increase by 500

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Overview of Build 1 and Build 2

Transit Comparison

- No major difference between the builds in number of unlinked transit trips or linked transit trips. A small number of transit trips are lost due to Bowdoin Station being eliminated, but more trips are gained overall by faster runtimes on the Blue Line to Charles/MGH Station.
- The connection between the Blue Line and Red Line reduces crowding at two key load points:
  - On the Red Line between Park St and Charles St
  - On the Green Line between Park St and Government Center
- The connection between the Blue Line and Red Line transfer activity at Government Center and Park Street Station

Highway Comparison

- 500 to 600 auto trips reduced between Cambridge and Revere
- Small amount of traffic relief on Cambridge St
- Produces some air quality benefits

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Charles/MGH Activity

Station Activity at Charles/MGH

Station	Estimates	Station Boardings		
		Total	Red	Blue
Charles/MGH	2008	9,840	9,840	-
Charles/MGH	2030 NB	10,050	10,050	-
Charles/MGH	2030 Build 1	20,600	13,050	7,550
Charles/MGH	2030 Build 2	22,080	12,610	9,470

Transfer Activity at Charles/MGH

	Transfers			
Station	N to/from W	S to/from W	N to/from E	S to/from E
2008	-	-	-	-
2030 NB	-	-	-	-
2030 Build 1	-	-	4,140	1,610
2030 Build 2	-	-	4,600	1,010

Blue Line to Green Line boardings at Government Center drop by 6,100 for Build 1 and by 5,900 for Build 2

Red Line to Green Line boardings at Park Street drop by 3,300 for Build 1 and by 3,500 for Build 2

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Questions and Answers

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Draft Environmental Impact Report

Kristine C. Gorman, STV Incorporated

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Next Steps

- Submit Alternatives Analysis –January 2010
- Submit Draft – Draft Environmental Impact Report & 10% Design Report - December 2009 – February 2010
- Submit Draft Environmental Impact Report – April 2010
- Public Hearing - May 2010
- Certificate Issued – June 2010

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EIR FULFILLMENT

- Respond thoroughly to Secretary's scope & all comments
- Perform thorough treatment of all issues
- Detailed mitigation measures & commitments
- **Pre-publication consensus of stakeholders**

GOAL

- Allow Secretary to issue certificate stating that no further analysis or public review is needed

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Impact Assessment

- Traffic Impact Analysis
- Air Quality
- Noise and Vibration
- Subsurface Excavation and Soil Removal
- Hazardous Materials
- Land Use
- Stormwater
- Groundwater
- Historic and Archaeological
- Environmental Justice

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Working Group Role in DEIR

- Delivery of Draft- DEIR to MassDOT – Feb. 2010
  - *Potential review roles for Working Group*

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Alternative 1&2 Capital Improvements

Mark Ennis, STV Incorporated

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Updated Open Cut Structures
(West to East)

Alternative 1:

1. Construction Staging Shaft
2. TBM Access Shaft
3. Charles MGH BL Egress
4. Vent Shaft No. 1 @ Anderson St.
5. Bowdoin Egress
6. TBM Receiver Shaft
7. CC from Station 19+50 to Station 27+30

Alternative 2:

1. Construction Staging Shaft
2. TBM Access Shaft
3. Charles MGH BL Egress
4. Vent Shaft No. 1 @ . Anderson St.
5. Vent Shaft No. 2 @ Joy St.
6. Bowdoin Egress
7. TBM Receiver Shaft
8. CC from Station 19+50 to Station 27+30

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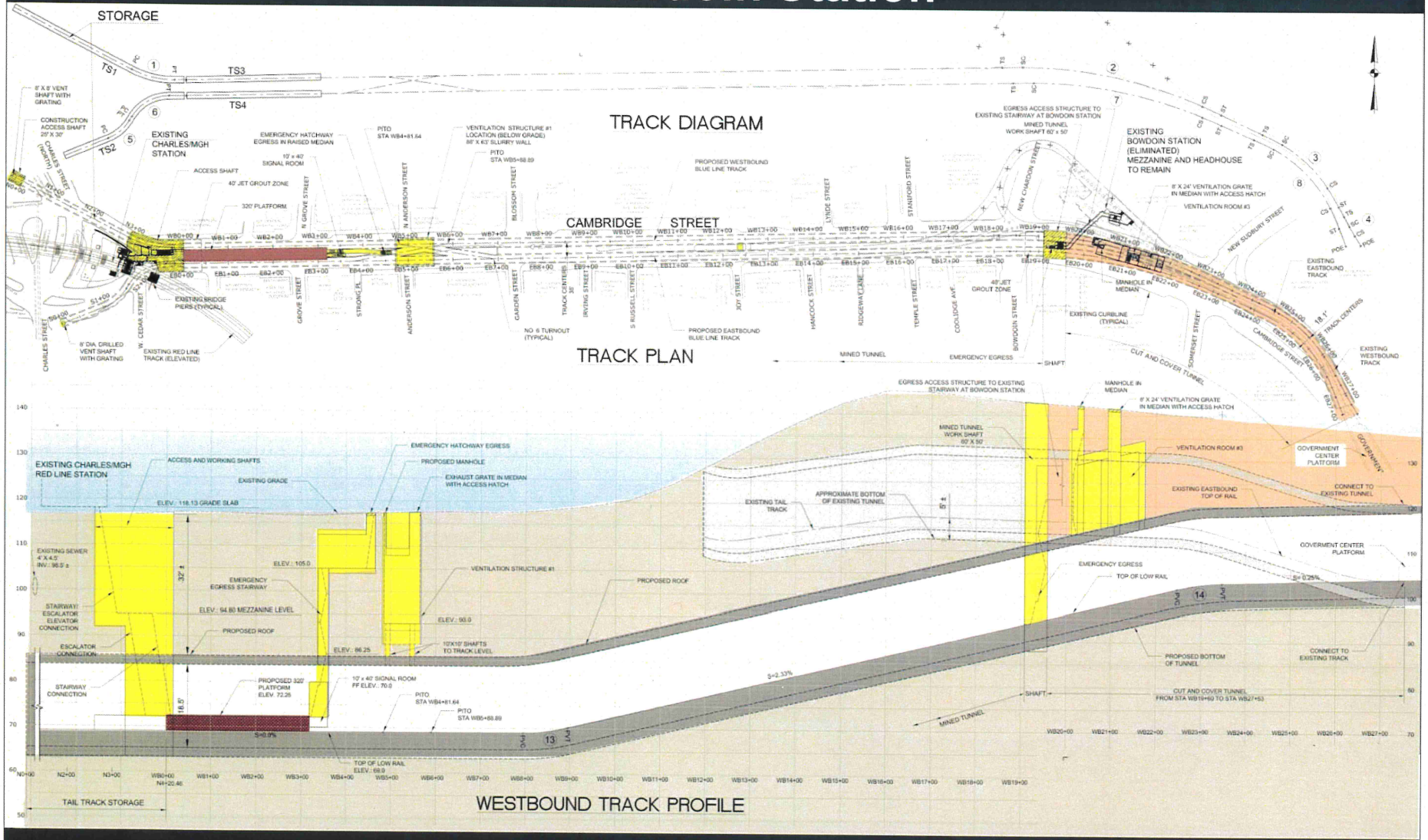
Alternative 1: Red / Blue Line Connector with Elimination of Bowdoin Station



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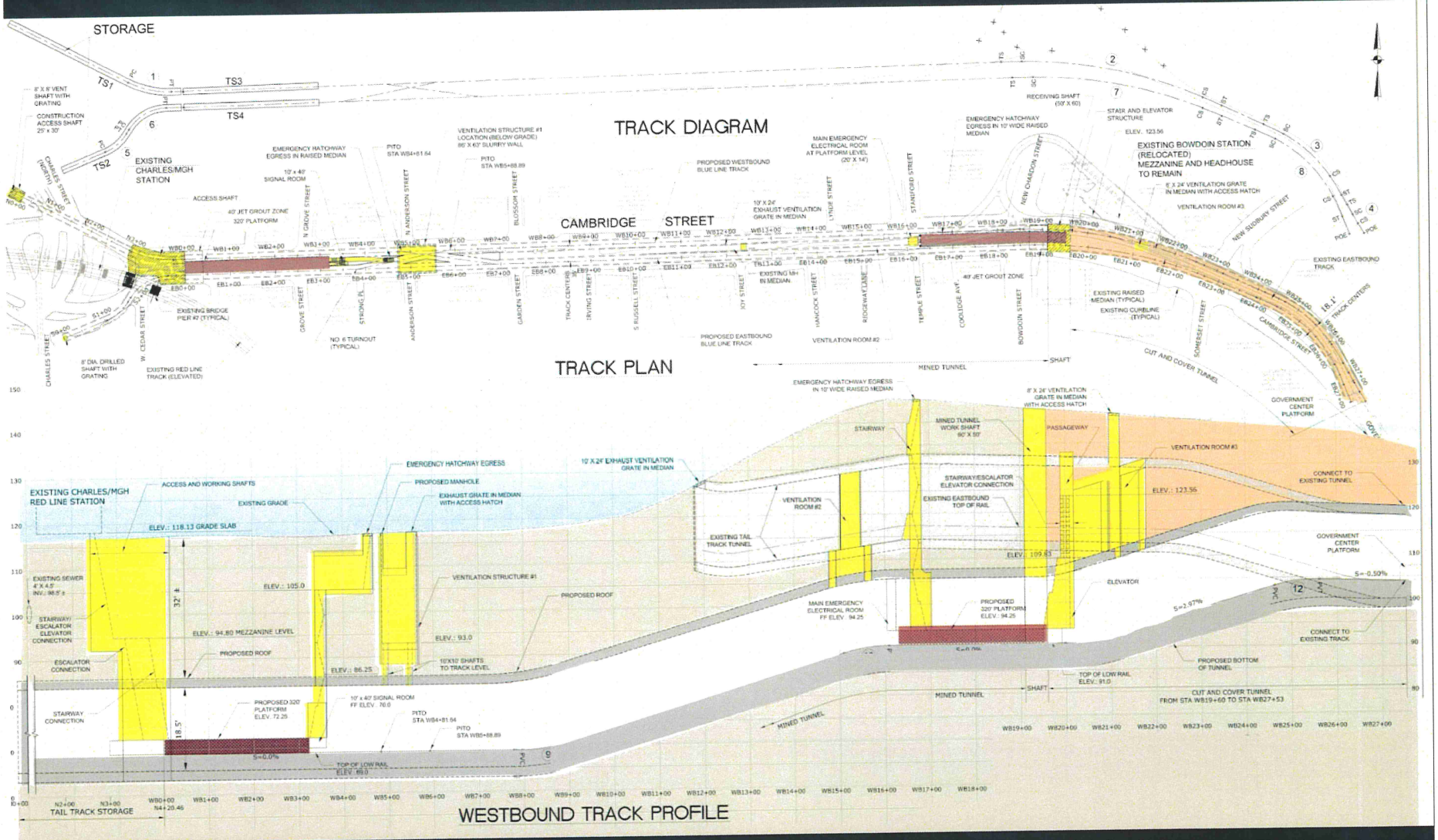
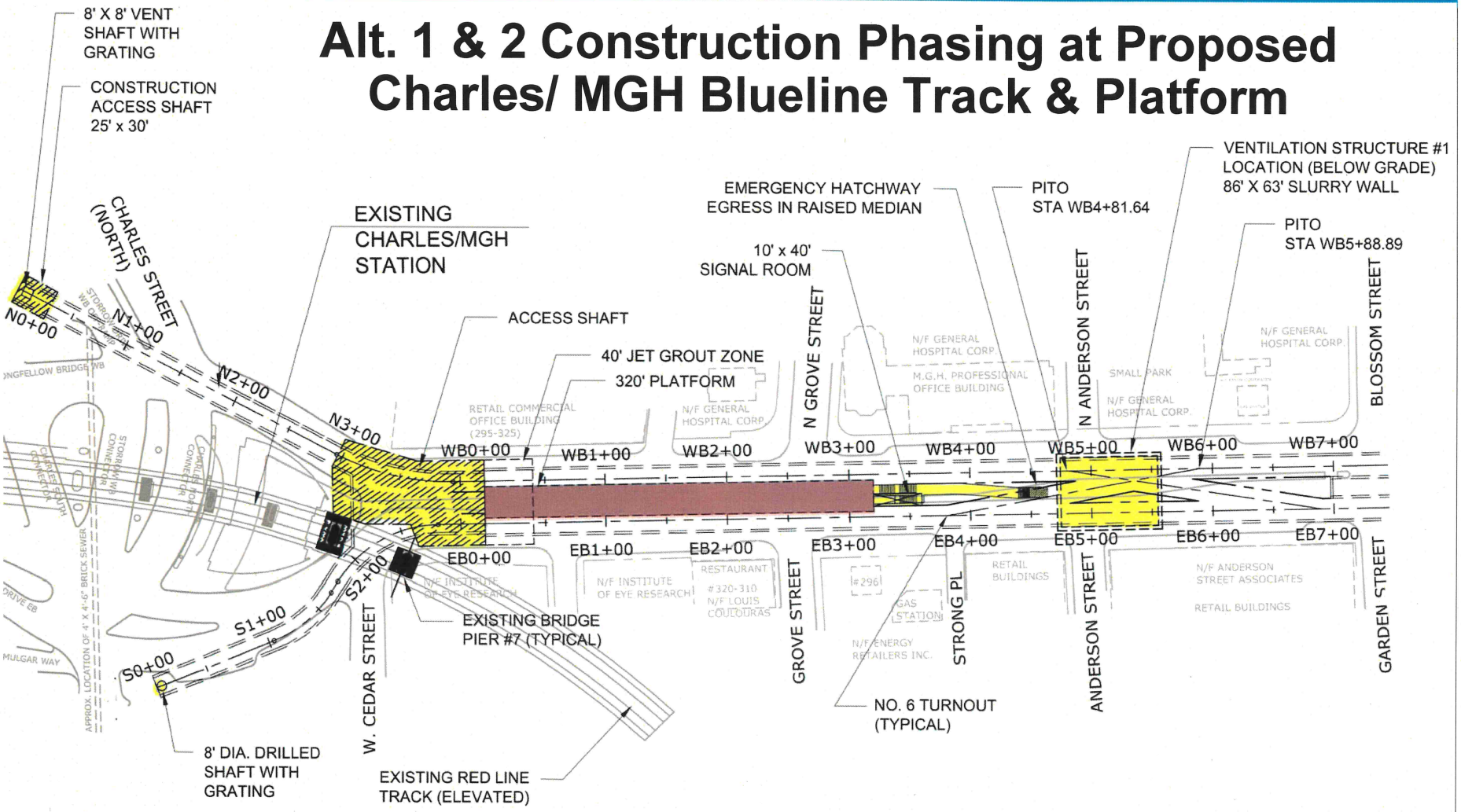
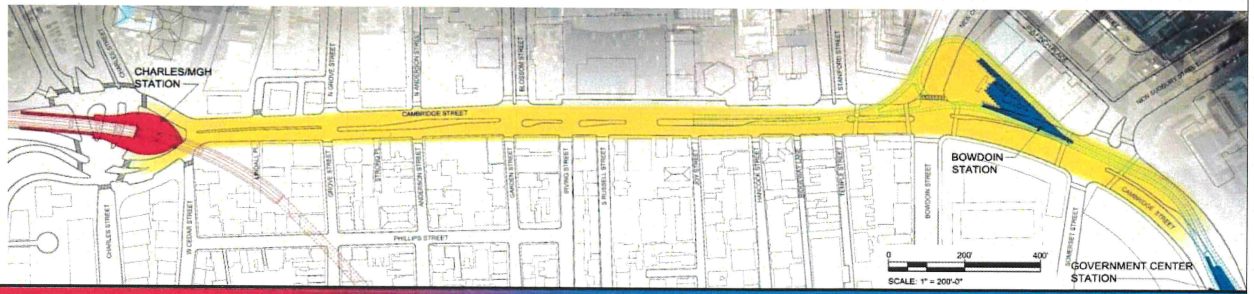
Alternative 2: Red / Blue Line Connector with Relocated Bowdoin Station



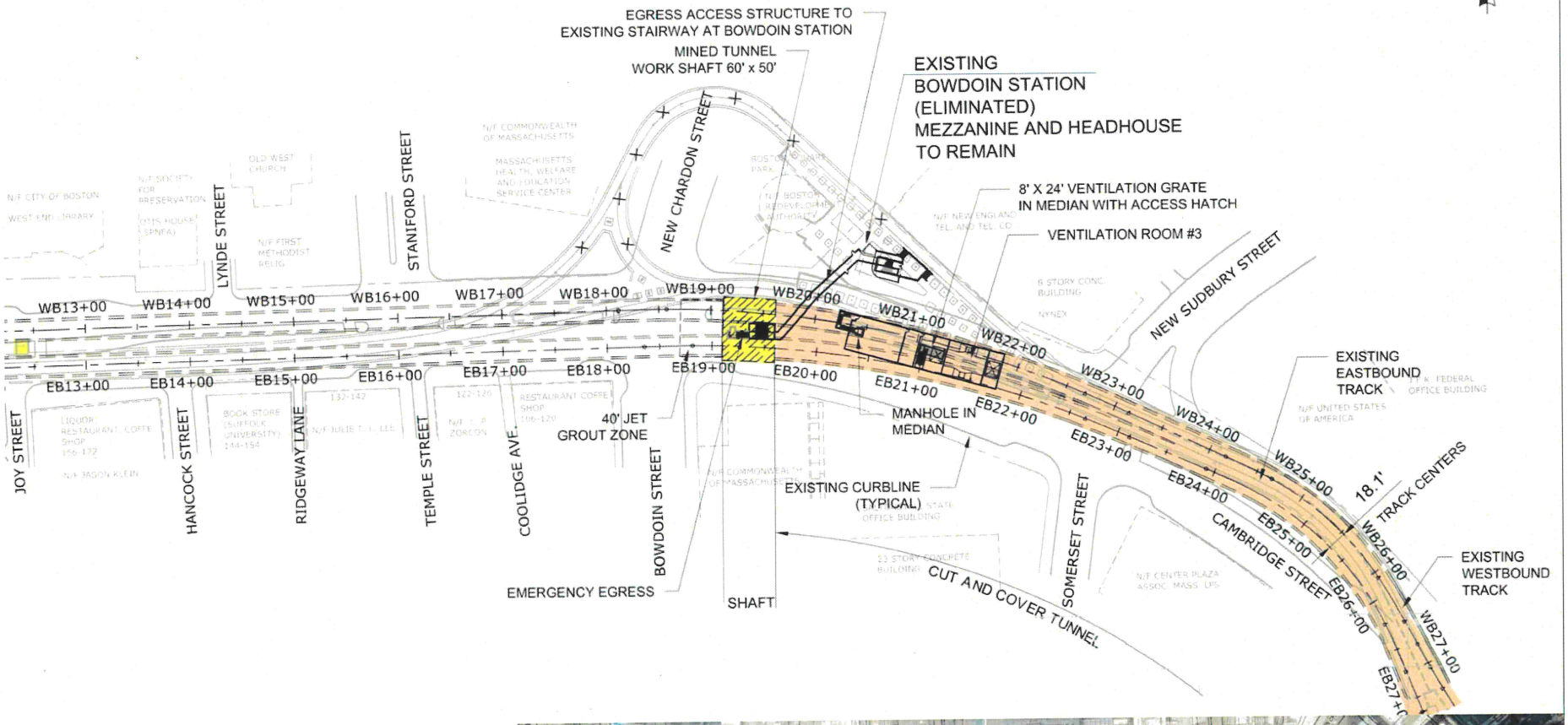
Alt. 1 & 2 Construction Phasing at Proposed Charles/ MGH Blueline Track & Platform

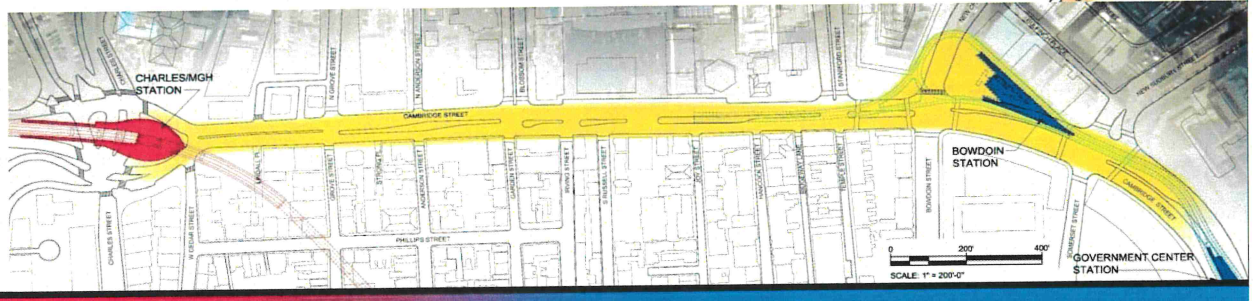


Red Line
Blue Line
CONNECTOR



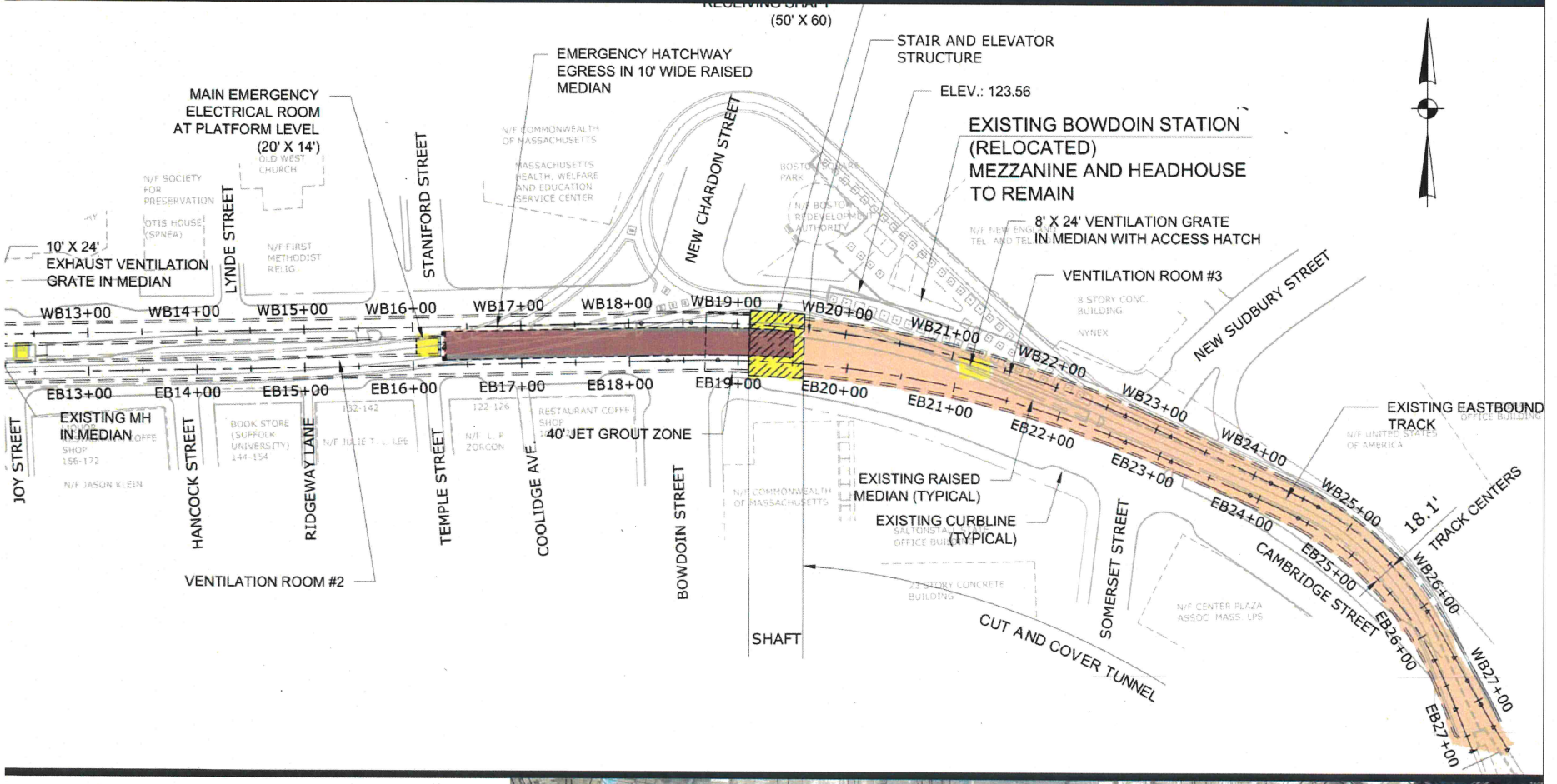
Alternative 1: Construction Phasing at Eliminated Bowdoin





Red Line
Blue Line
CONNECTOR

Alternative 2: Construction Phasing at Relocated Bowdoin



Red Line
Blue Line
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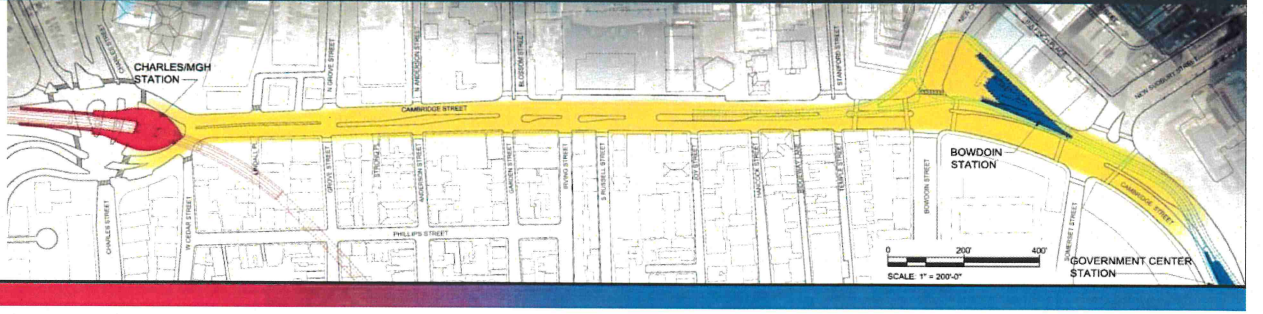
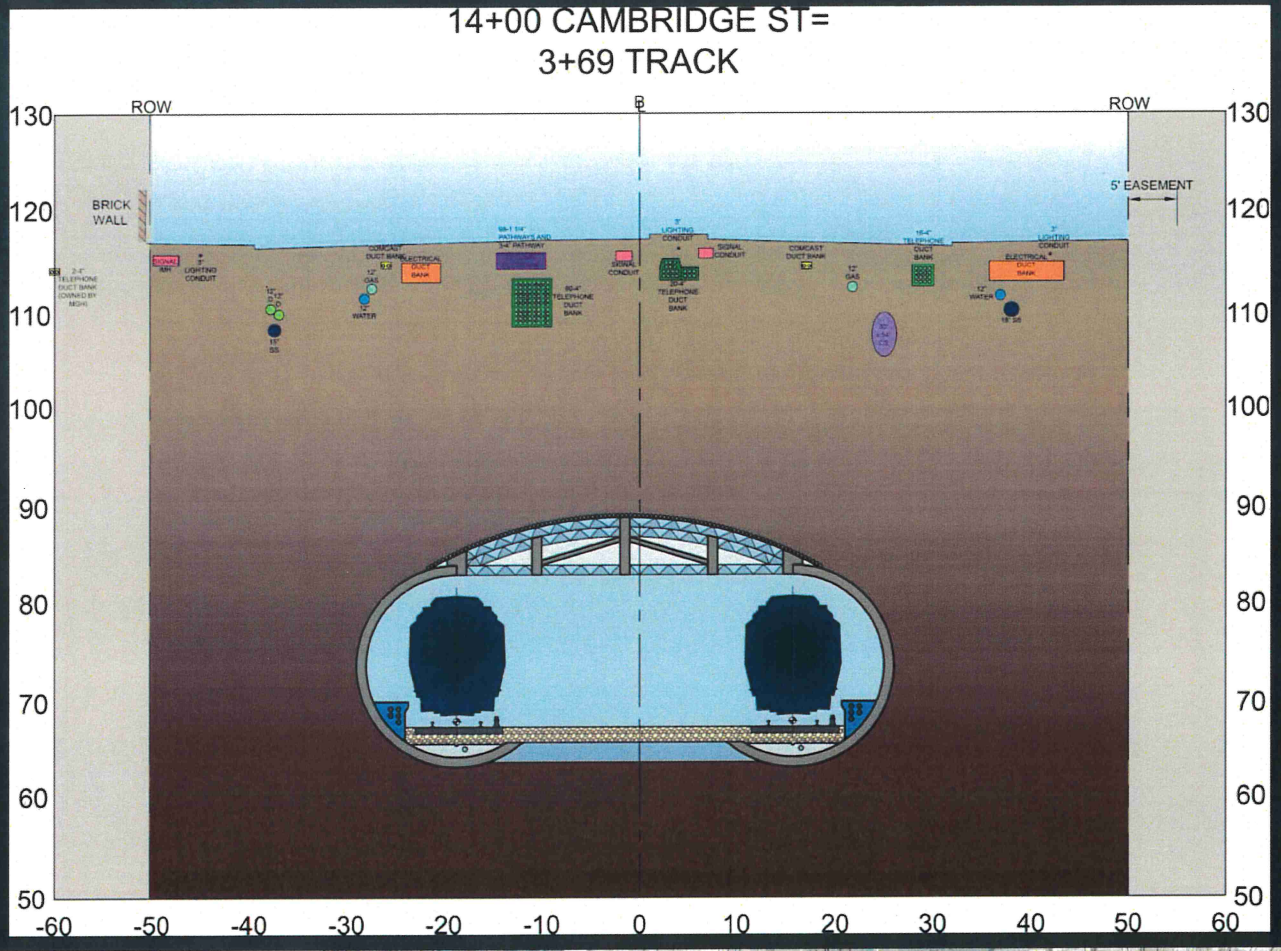


Alternative 1 & 2: Mined Tunnel Section



Red Line
Blue Line
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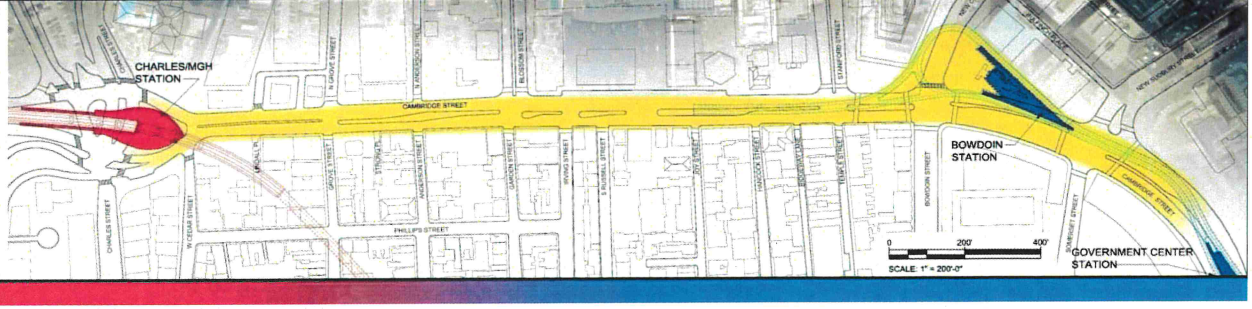
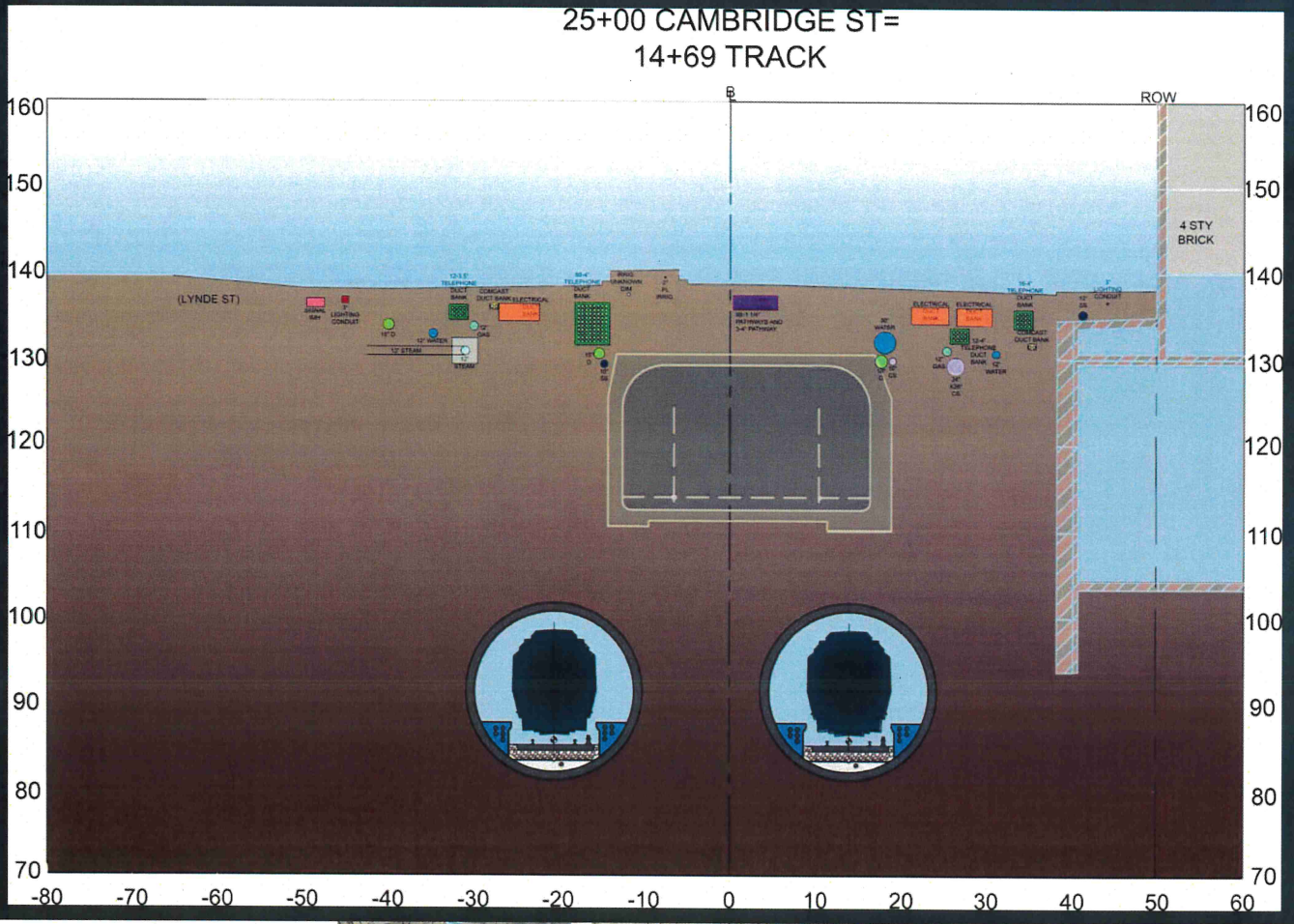
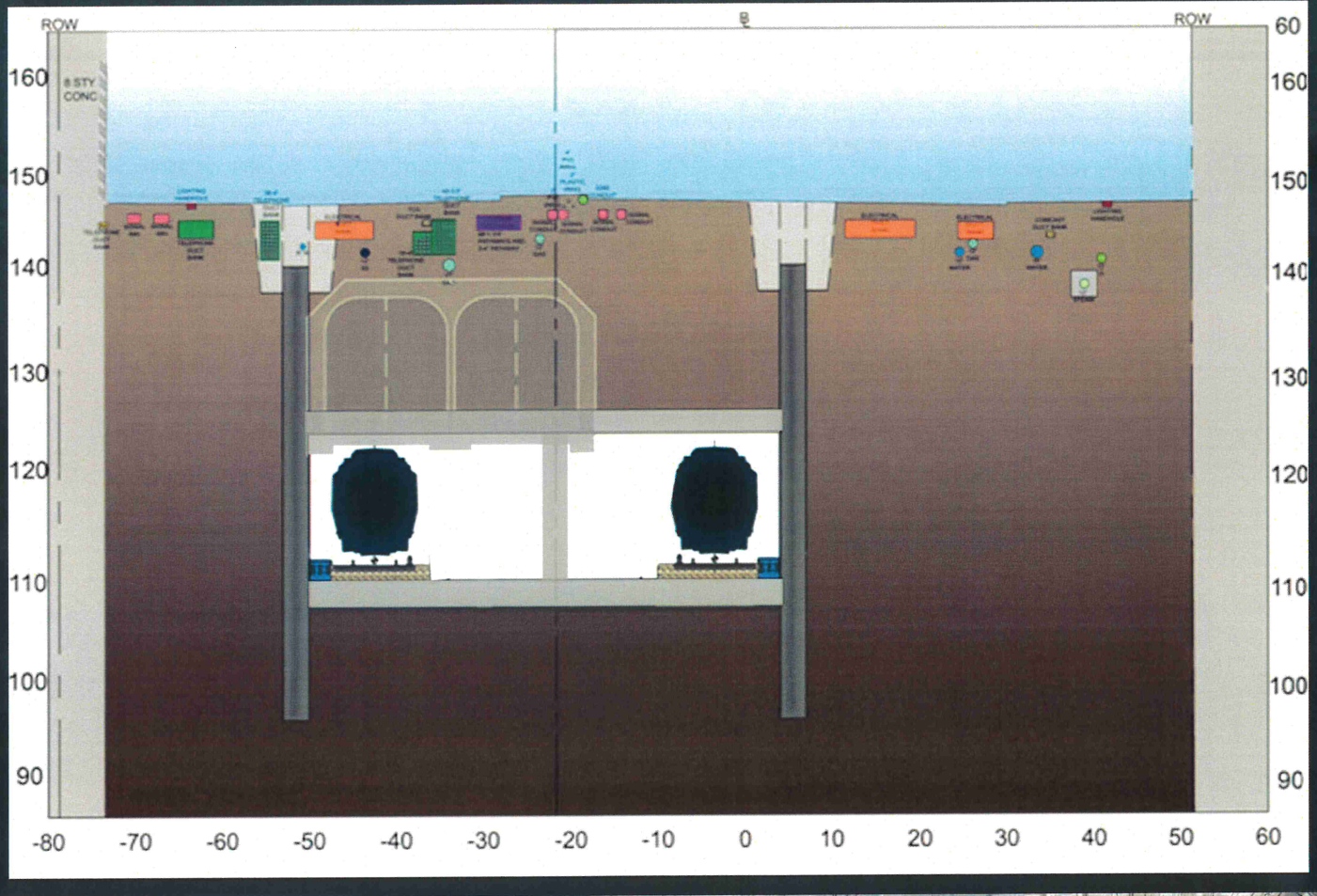


Alternative 1 & 2: Mined Tunnels Section

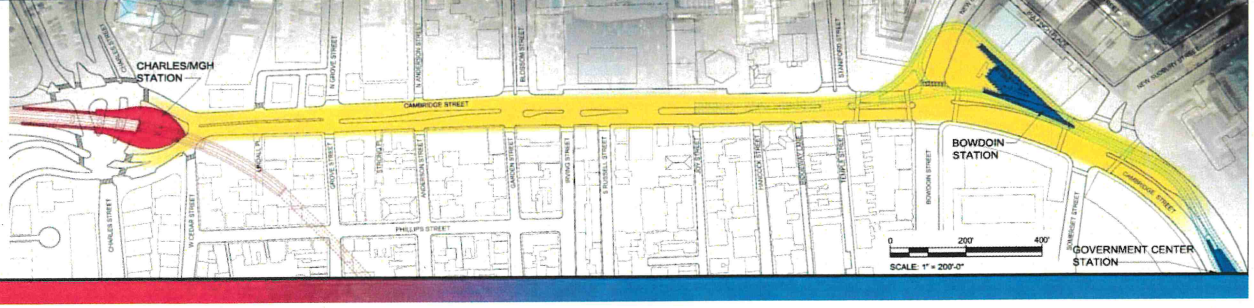


Red Line
Blue Line
CONNECTOR

Alternatives 1 & 2: Cut and Cover Section



Red Line
Blue Line
CONNECTOR



Schedule Impacts

- **Proposed Start of Construction: July-2012**
- **Anticipated Completion Date: September 2018**
- **Construction Duration: 6 years and 3 months**

Schedule Basis and Assumptions

- The Notice to Proceed date of July 2012 is an assumed date

(Significant Limitations-of-Operations)

- No interruption of Red Line service during construction
- At-grade night work (10:00pm to 7:00am) limited due to residential areas
- Blue Line Service interrupted during installation of Government Center crossover
- Bowdoin Station closes following Government Center crossover installation

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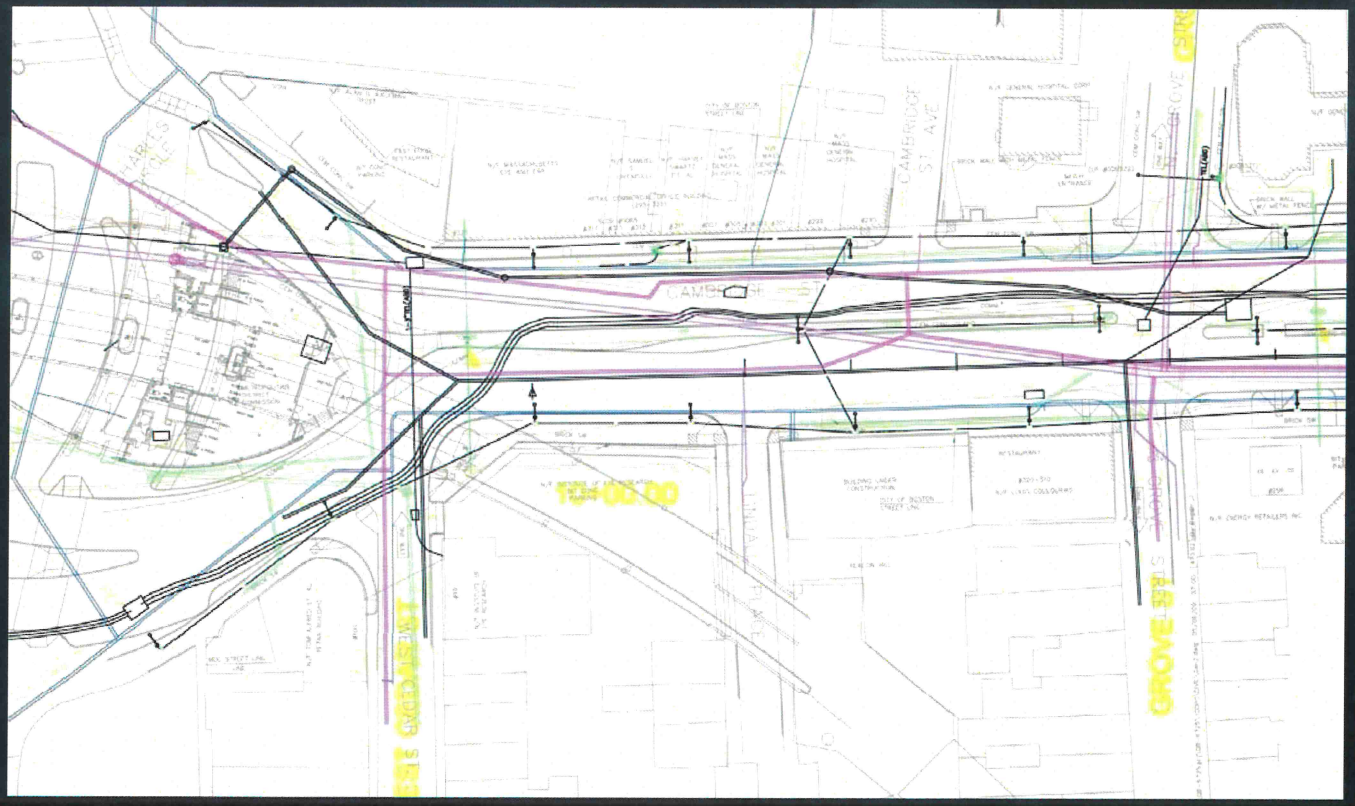
Schedule Considerations

1. Utility relocations must occur prior to each open cut section
2. Mining operation based on a 7 day work week with 3 - 8 hour shifts
3. Majority of remaining work based on a 5 day work week with 8 hour shifts and some night and weekend work



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Preliminary Production Rates

- Excavation for Storage Tunnels No.1 & 2 (Sequential Mining) = 3 feet per day
- Excavation for Subway Mainline Tunnels (TBM) = 30 feet per day
- Excavation for Access Shaft No. 1, 2 and 3 = 240 cy per day (120 cy per shift)
- Exc. for Cut & Cover = 2 crews at 320 cy per shift (2 shifts = 640 cy per day)
- Construction of tunnel invert slabs: 1 – 40 foot section per week
- Construction of the final Liner: 1 – 40 foot section per week
- Construction of the cast in- place base slabs: 1 – 40 foot section per week
- Construction of the cast in- place walls sections: 1 – 40 foot section per week
- Construction of the cast in-place roof slabs: 1 – 40 foot section = 2 weeks

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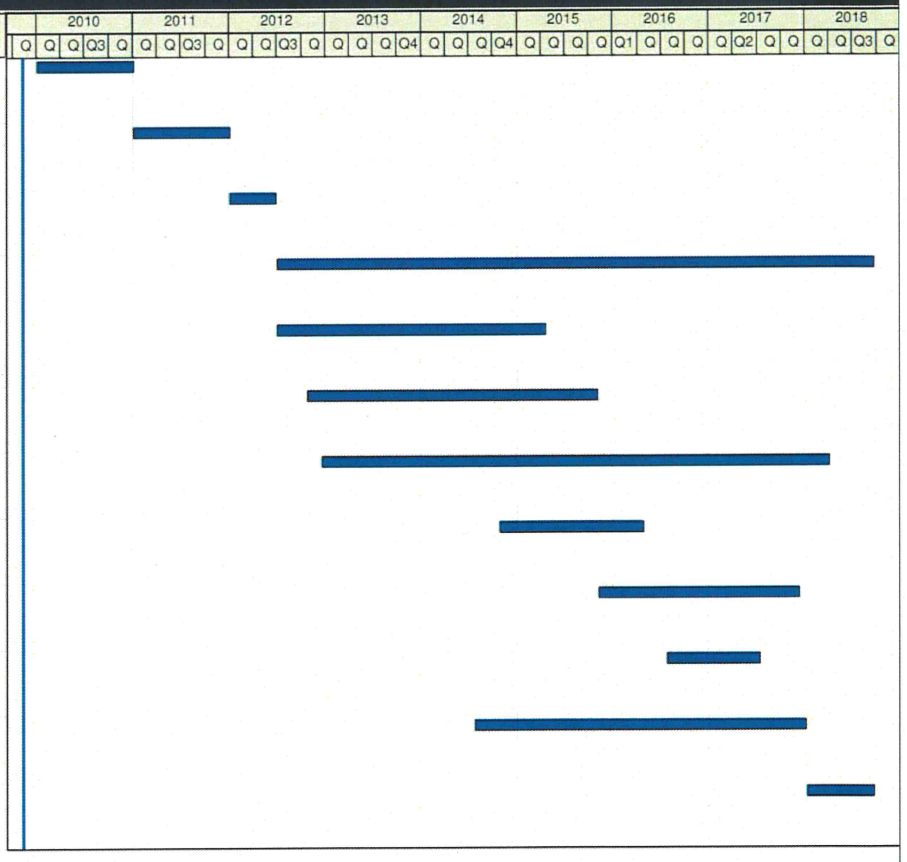
Summary Schedule & Phasing

Activity ID	Activity Name	Early Start	Early Finish
	Preliminary Design	04-Jan-10	03-Jan-11
	Final Desig/n	04-Jan-11	03-Jan-12
	Bid and Award Activities	04-Jan-12	29-Jun-12
	Major Phases of Construction	02-Jul-12	21-Sep-18
	Phase 1 - Initial Utility Relocation and Other Initial Activities	02-Jul-12	22-Apr-15
	Phase 2A - Northerly Tunnel Construction	25-Oct-12	06-Nov-15
	Phase 2B - Top Down Cut and Cover East of Receiving Pit	24-Dec-12	03-Apr-18
	Phase 3A - Utility Relocation	27-Oct-14	27-Apr-16
	Phase 3B - Southerly Tunnel Construction	09-Nov-15	12-Dec-17
	Phase 4 - Center Arch and Platform Construction	27-Jul-16	14-Jul-17
	Phase 5 - Systems Installation	24-Jul-14	05-Jan-18
	Phase 6 - Testing and Closeout	09-Jan-18	21-Sep-18



Remaining Work
Critical Remaining Work
Milestone
Summary

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Construction Phase 1

PHASE	TASK		
	TASK NO.	DESCRIPTION	CONSTRUCTION METHODS
1-Utility Relocation and Initial Activities	1	Mobilization	
	2	MEEI Parking Mitigation	
	3	Underpinning of Red Line Pier No. 7	Pile driving, Jacking of Underpinning Beams
	4	Reconstruction of Red Line Pier No. 6	Pile Driving, Temp.support, Pier Demolition, New Pier Construction, Transfer of Loads to the New Structure
	5	Temporary Depression of the Exist. Mass Ear Parking Lot under the Ramp from the Storrow Drive	
	6	Initial Utility Relocation to the Southerly Side of Cambridge Street @ the Starter Hole Location	
		Initial Utility Relocation to the Southerly Side of Cambridge Street @ the Receiver Hole Location	
	7	Utility Relocation @ the Cut and Cover Area (East of Bowdoin Station)	
	8	Initial Signal and Track Changes	
		Installation of Second Crossover East of Government Center Station	
		Modifications to Signal Control Lines for Signal 910	
		Relocation of 907 Signal Case	
		Creation of a new Signal Case on GVT Sta. Platform to terminate 910 and 4-2W Signal Control Lines and the transformer and Resistors for 910 Circuit	
		Installation of Trips and Signal in the middle of both GVT CTR Platforms	
		Installation of Very Large Track Bumpers	
	9	**Close down the Existing Bowdoin Station**	

Construction Phases 2A & 2B

PHASE	TASK		
	TASK NO.	DESCRIPTION	CONSTRUCTION METHODS
2A - Northerly Tunnel Construction	1	Grouting for the Northerly Track Tunnel	
		Northerly Tail Track Tunnel Construction	Sequential Mining
	2	Partial Removal of the Present Charles/MGH Red Line Station Impacted Curtain Wall, Installation of Temp. Roof Beam Supports	
		Northerly Part of the Starter Hole Excavation with Traffic Decking Installation (nights and weekends)	Conventional Earth Supporting Method
	3	Grouting for the Northerly Tube (nights and weekends)	
		Install TBM for the Northerly Tube Construction (weekend)	
	4	Mining the Northerly Tube between the Starter Hole and the Receiver Hole	TBM
		Construct Escalators and Elevator at the Northern Part of Charles/MGH Station	
		Northerly Part of the Receiver Hole Area Excavation with Traffic Decking Installation (nights and weekends)	Conventional Earth Supporting Method
	5	Construction of the Northerly Part of the Tunnel Roof and the Structure above housing the Traction Power Substation and the Elec. Substation at the Starter Hole Area	Conventional Building Floor, Wall and Roof Construction
		Extract TBM from the Receiver Hole (weekend)	
	6	Construction of the Northerly Part of the Tunnel Roof at the Receiver Hole Area	Conventional Building Floor, Wall and Roof Construction
2B - Cut & Cover Tunnel	1	Construct Cut and Cover area East of the Receiver Hole Area with Traffic Decking Installation (nights and weekends)	Slurry Wall Earth Support System, Partial or Full Demolition of the Exist. Tunnel

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Construction Phases 3A & 3B –Alt. 1

PHASE	TASK		
	TASK NO.	DESCRIPTION	CONSTRUCTION METHODS
3A - Utility Relocation	1	Temporary and Permanent Utility Relocation from Southerly Side of Cambridge Street to the Northerly Side at the Starter Hole Area	
	2	Temporary and Permanent Utility Relocation from Southerly Side of Cambridge Street to the Northerly Side at the Receiver Hole Area	
3B - Southerly Tunnel Construction	1	Grouting for the Southerly Tube (nights)	
		Install TBM for the Southerly Tube Construction (weekend)	
	2	Southerly Part of the Starter Hole Excavation with Traffic Decking Installation (nights and weekends)	Conventional Earth Supporting Method
	3	Mining the Southerly Tube between the Starter Hole and the Receiver Hole	TBM
		Construct Stairs at the Southerly Part of Charles/MGH Station	
		Construction of the Southerly Part of the Tunnel Roof and the Structure above housing the Traction Power Substation and the Elec. Substation at the Starter Hole Area	Conventional Building Floor, Wall and Roof Construction
	4	Extract TBM from the Receiver Hole (weekend)	
	5	Backfilling the Southern Part of the Starter Hole Area	
		Restoration of the Roof and Curtain Wall at the Present Charles/MGH Station	
		Construction of the Southerly Part of Tunnel Roof at the Receiver Hole Area	Conventional Wall and Roof Construction
	6	Backfilling the Receiver Hole Area	Conventional Building Floor, Wall and Roof Construction
		Grouting for the Southerly Tail Track Tunnel (nights)	
	7	Southerly Tail Track Tunnel Construction	Sequential Mining
		Construction of Ventilation Structure No. 2 East of the Bowdoin Station Egreesway	

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Construction Phase 4: Alternative -1

PHASE	TASK		
	TASK NO.	DESCRIPTION	CONSTRUCTION METHODS
4-Center Arch and Station Construction	1	Construct the Center Arch between the two tubes at the Cross over Area	Sequential Mining
		Construct the Center Arch between the two tubes at the Charles/MGH Station Platform Area	Sequential Mining
	2	Slurry Wall Construction, Excavation, Construction and Backfill for Ventilation Structure No.1 at the Cross Over Area	Slurry Wall Earth Support System
		Permanent Utility Relocation @ the Cut and Cover Area (East of Bowdoin Station)	
		Construct Egressway at the Charles/MGH Station Area	Soldier Pile and Lagging Earth Support System
		Construct Egressway at the New Bowdoin Station Area	Soldier Pile and Lagging Earth Support System
		Construct Platforms at the Charles/MGH Station	Conventional Construction Method
		Tunnel Finishes	
		Track Work	Direct Fixation Track System
		Cambridge Street Surface Restoration	

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Construction Phases 5 & 6

PHASE	TASK		
	TASK NO.	DESCRIPTION	CONSTRUCTION METHODS
5- Systems Installation	1	Install Traction Power Substation Equipment and Cables	
		Install Electric Substation Equipment and Cables	
		Install Signal Bungalow and Signalization and Cables	
		Install Communication Equipment and Cables	
6- Testing and Closeout	1	System and Revenue Testing	
	2	Demobilization and Project Close out	

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Construction Phases 3A & 3B –Alt. 2

PHASE	TASK		
	TASK NO.	DESCRIPTION	CONSTRUCTION METHODS
3A - Utility Relocation	1	Temporary and Permanent Utility Relocation from Southerly Side of Cambridge Street to the Northerly Side at the Starter Hole area	
	2	Temporary and Permanent Utility Relocation from Southerly Side of Cambridge Street to the Northerly Side at the Receiver Hole area	
3B - Southerly Tunnel Construction	1	Grouting for the Southerly Tube (nights)	
		Install TBM for the Southerly Tube Construction (weekend)	
	2	Southerly Part of the Starter Hole Excavation with Traffic Decking Installation (nights and weekends)	Conventional Earth Supporting Method
	3	Mining the Southerly Tube between the Starter Hole and the Receiver Hole	TBM
		Construct Stairs at the Southerly Part of Charles/MGH Station	
		Construction of the Southerly Part of the Tunnel Roof and the Structure above housing the Traction Power Substation and the Elec. Substation at the Starter Hole Area	Conventional Building Floor, Wall and Roof Construction
	4	Extract TBM from the Receiver Hole (weekend)	
	5	Backfilling the Southern Part of the Starter Hole Area	
	6	Restoration of the Roof and Curtain Wall at the Present Charles/MGH	
		Construction of the Southerly Part of Tunnel Roof at the Receiver Hole Area	Conventional Wall and Roof Construction
	7	Backfilling the Receiver Hole Area	Conventional Building Floor, Wall and Roof Construction
		Grouting for the Southerly Tail Track Tunnel (nights)	
	8	Southerly Tail Track Tunnel Construction	Sequential Mining
		Construction of Ventilation Structure West of Bowdoin Station	
		Construction of Ventilation Structure East of Bowdoin Station	

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Construction Phase 4: Alternative -2

PHASE	TASK		
	TASK NO.	DESCRIPTION	CONSTRUCTION METHODS
4-Center Arch and Station Construction	1	Construct the Center Arch between the two tubes at the Cross over Area	Sequential Mining
		Construct the Center Arch between the two tubes at the Charles/MGH Station Platform Area & Bowdoin Station	Sequential Mining
	2	Slurry Wall Construction, Excavation, Construction and Backfill for Ventilation Structure No.1 at the Cross Over Area	Slurry Wall Earth Support System
		Permanent Utility Relocation @ the Cut and Cover Area (East of Bowdoin Station)	
		Construct Egressway at the Charles/MGH Station Area	Soldier Pile and Lagging Earth Support System
		Construct Egressway at the New Bowdoin Station Area	Soldier Pile and Lagging Earth Support System
		Construct Platforms at the Charles/MGH Station	Conventional Construction Method
		Construct Platforms at the Bowdoin Station	Conventional Construction Method
		Construction of the Bowdoin Station Entranceway	
		Tunnel Finishes	
		Track Work	Direct Fixation Track System
		Cambridge Street Surface Restoration	

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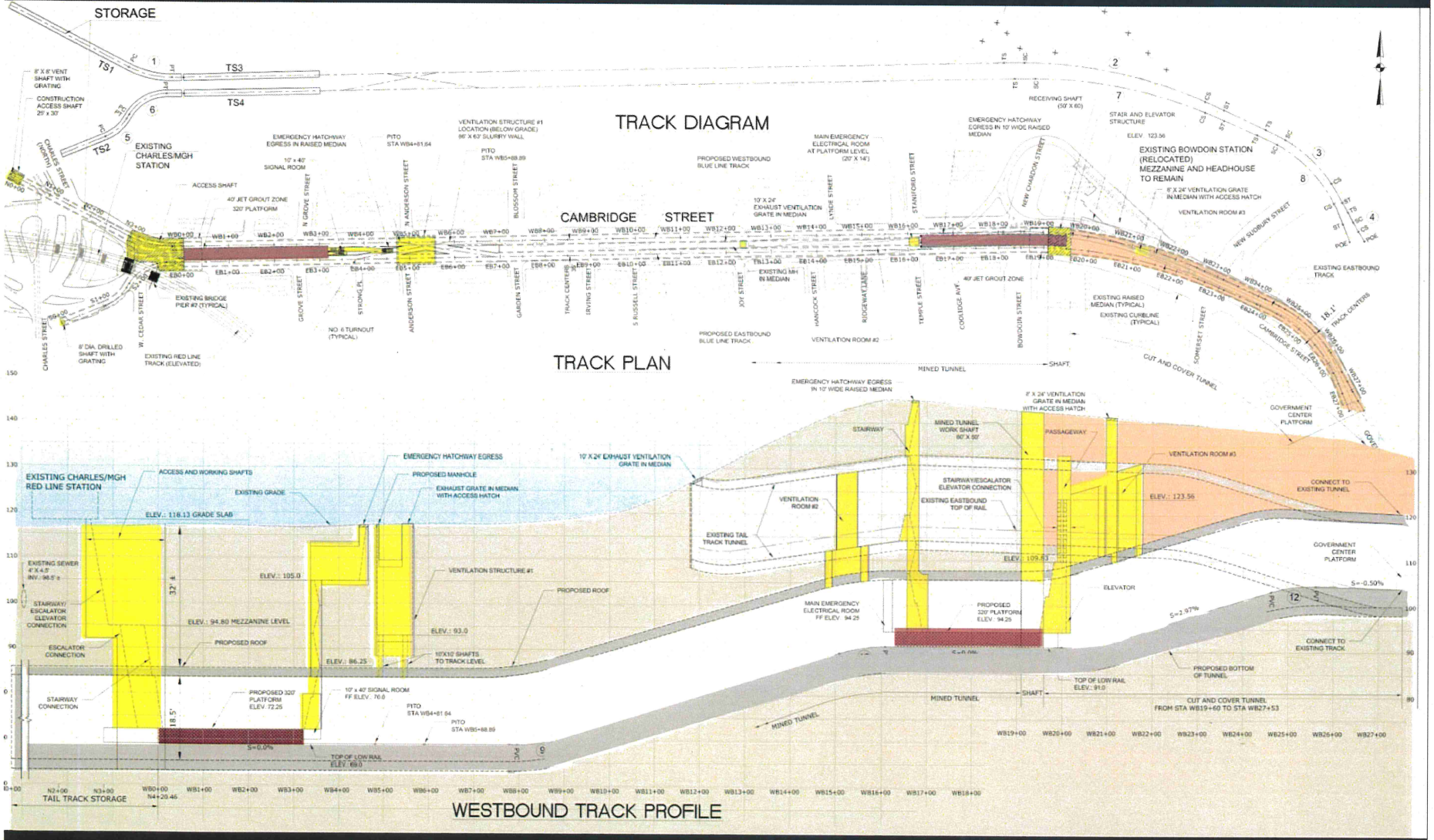
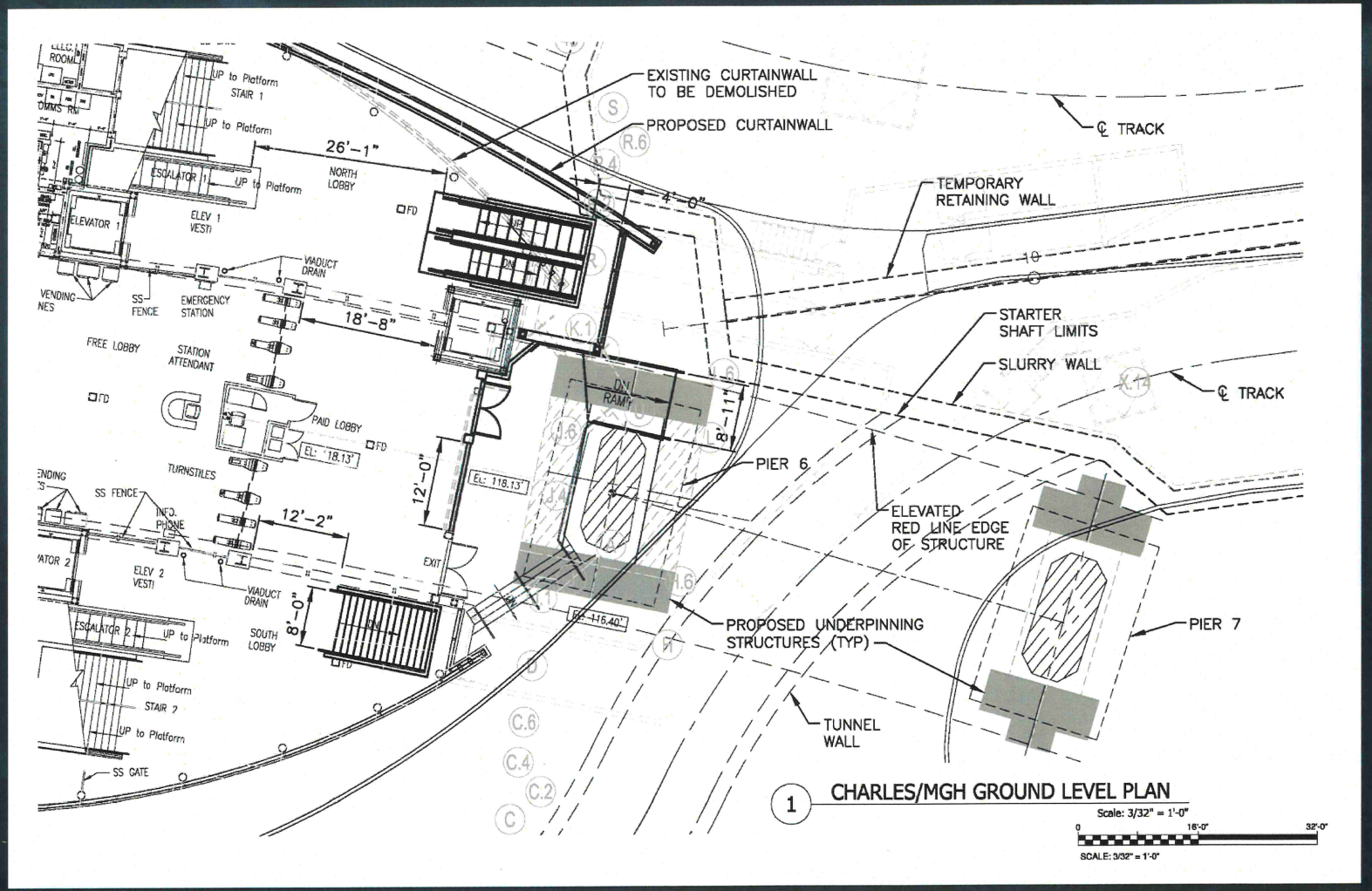
Stations & Egress

Kristine C. Gorman, STV Incorporated

Alternative 2: Red / Blue Line Connector with Relocated Bowdoin Station



Alt. 1&2 at Charles MGH Blue Line



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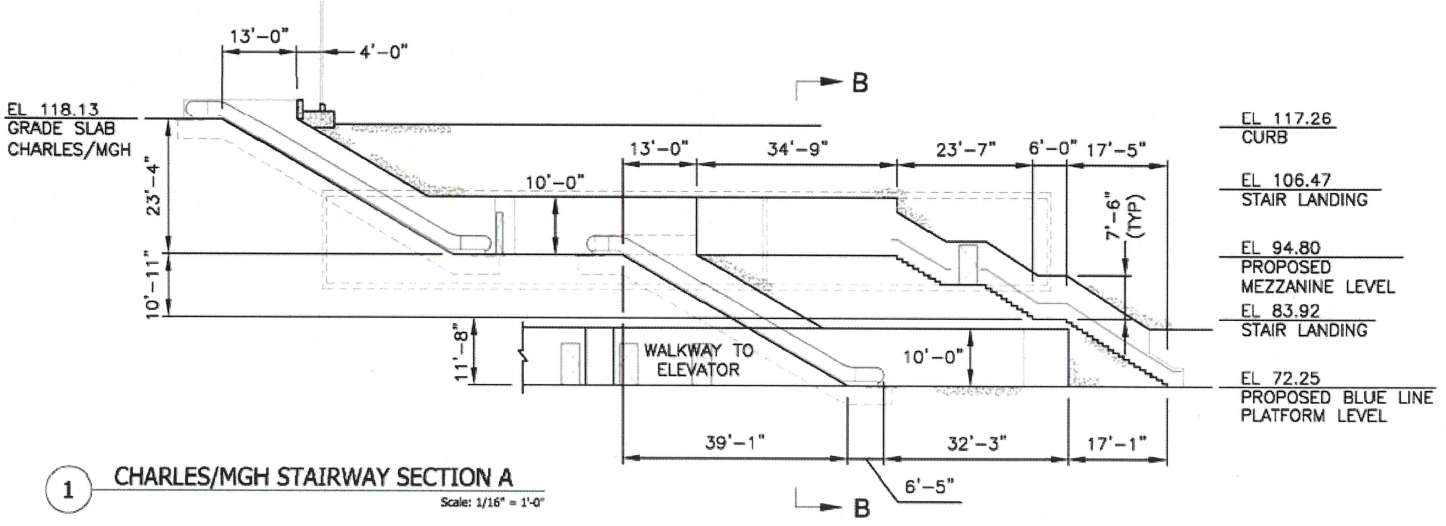
Alt. 1&2 at Charles MGH Blue Line



1 CHARLES/MGH STAIRWAY SECTION A

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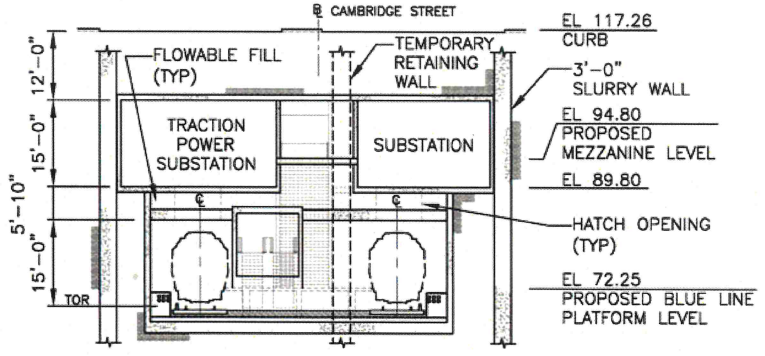
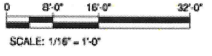


2 CHARLES/MGH SECTION B

Scale: 1/16" = 1'-0"



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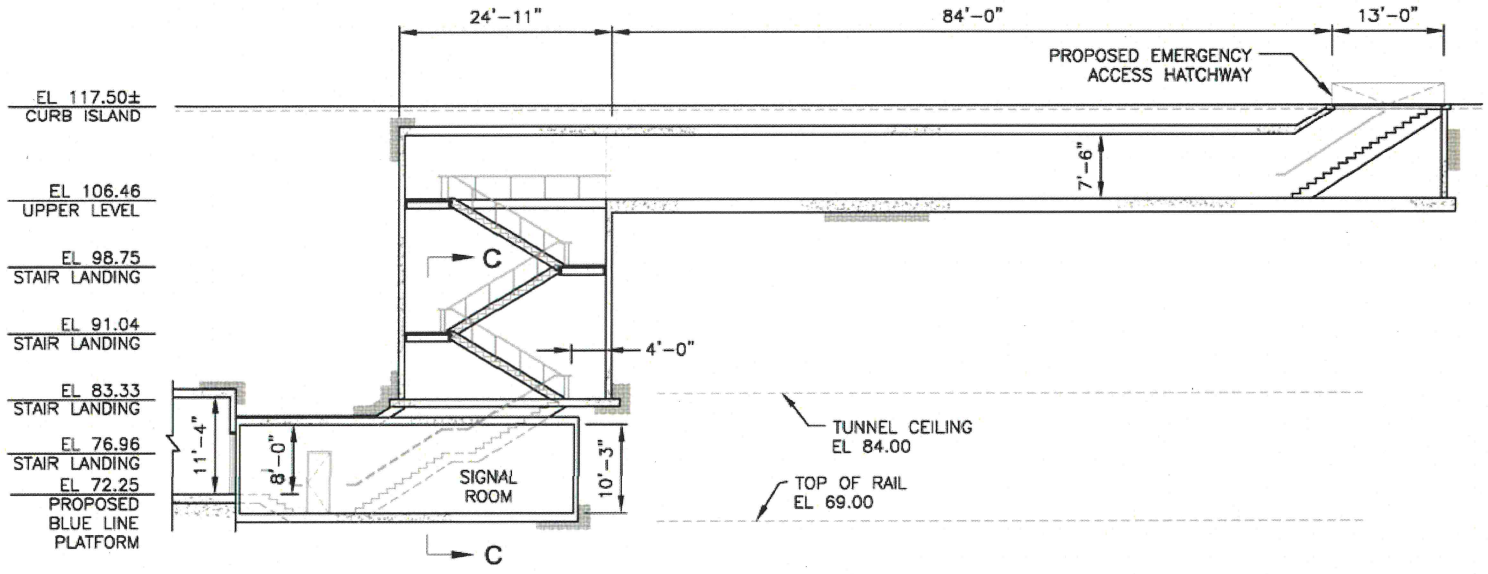
Alt. 1&2 at Charles MGH Blue Line



1 CHARLES/MGH EMERGENCY EGRESS SECTION

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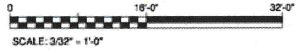

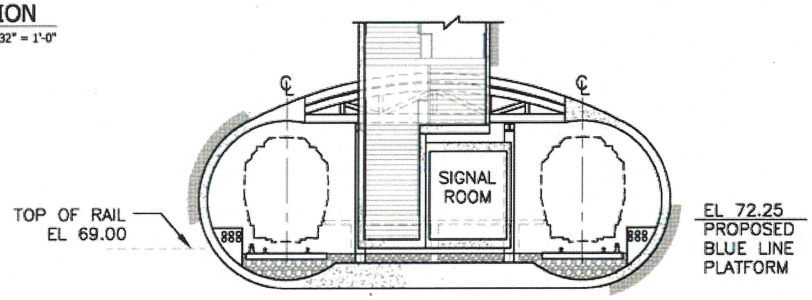

2 CHARLES/MGH EMERGENCY EGRESS SECTION C

Scale: 3/32" = 1'-0"

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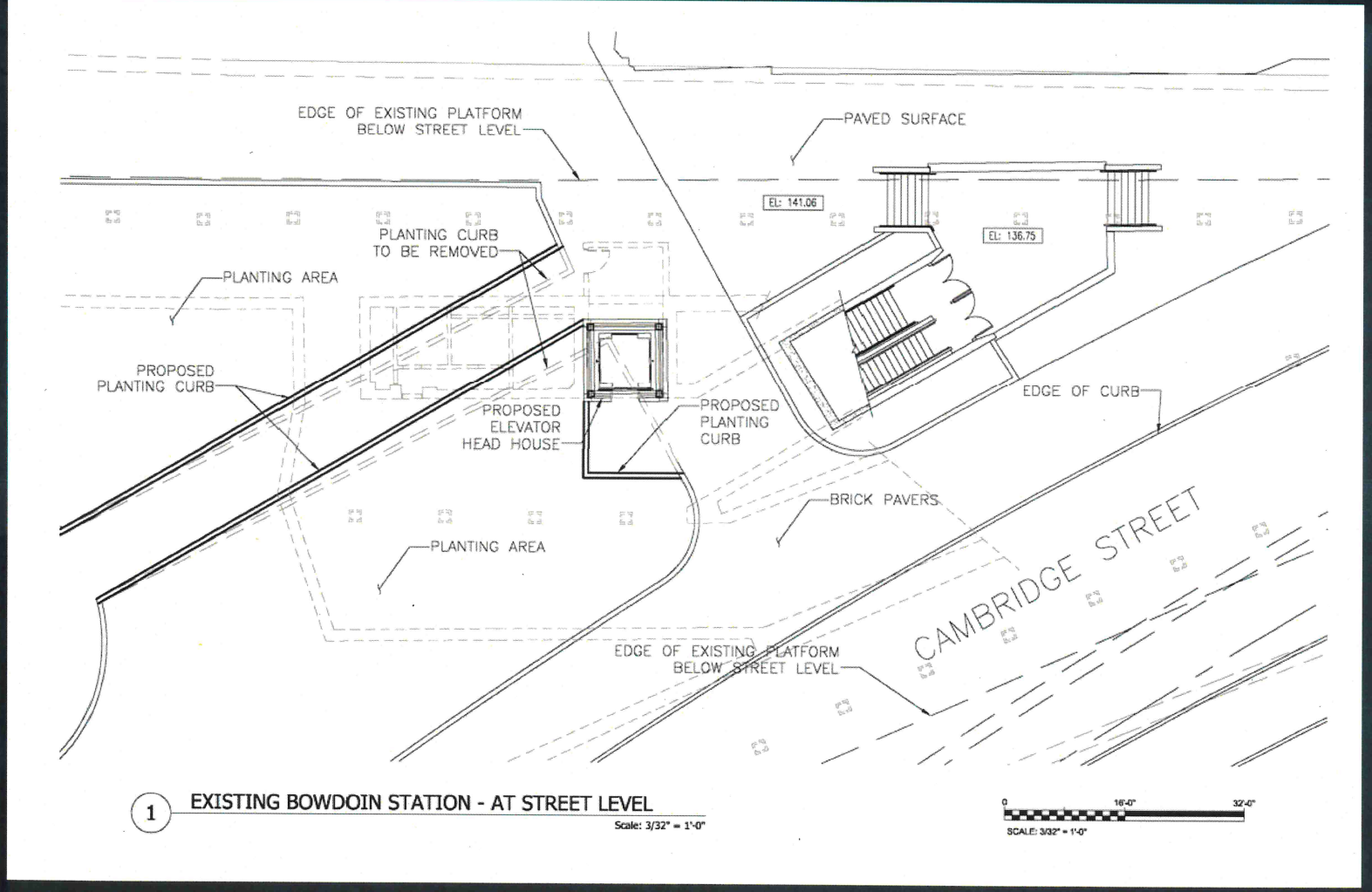
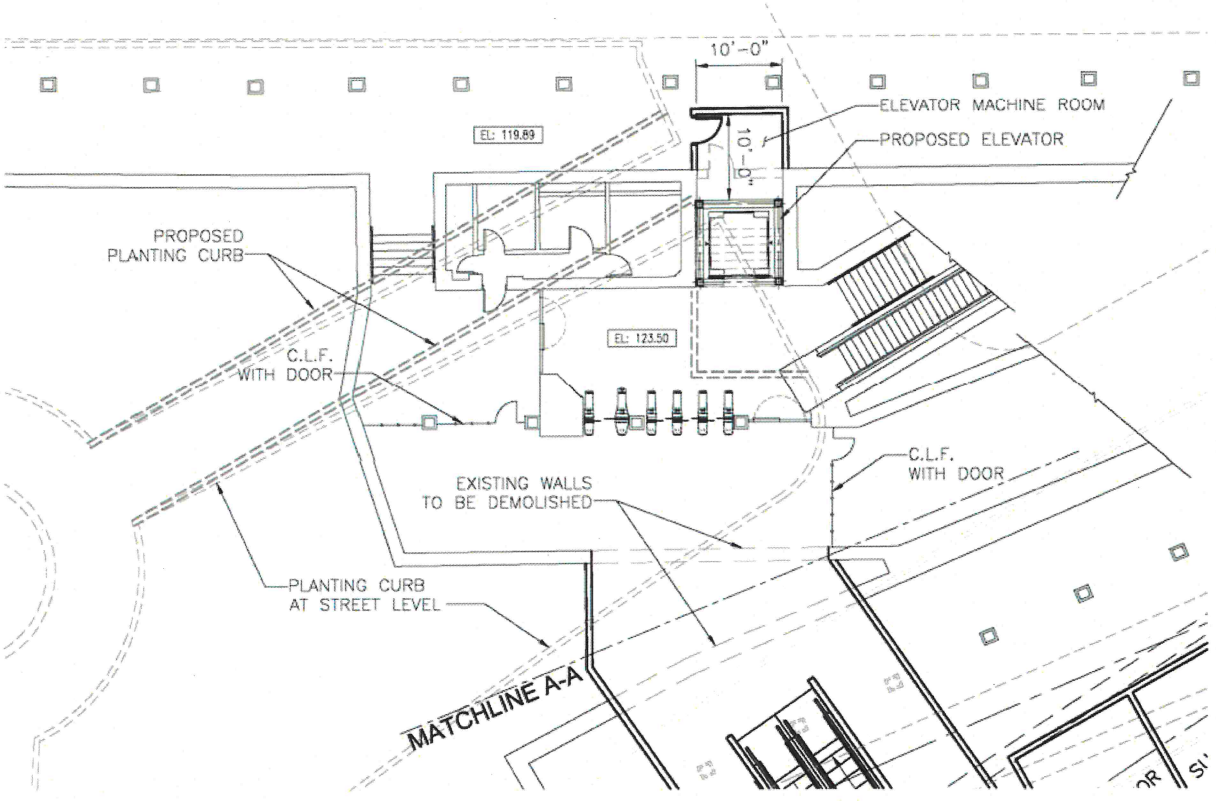
Alternative 2 at Relocated Bowdoin



STV

Alternative 2 at Relocated Bowdoin



2 EXISTING BOWDOIN STATION - BELOW STREET LEVEL

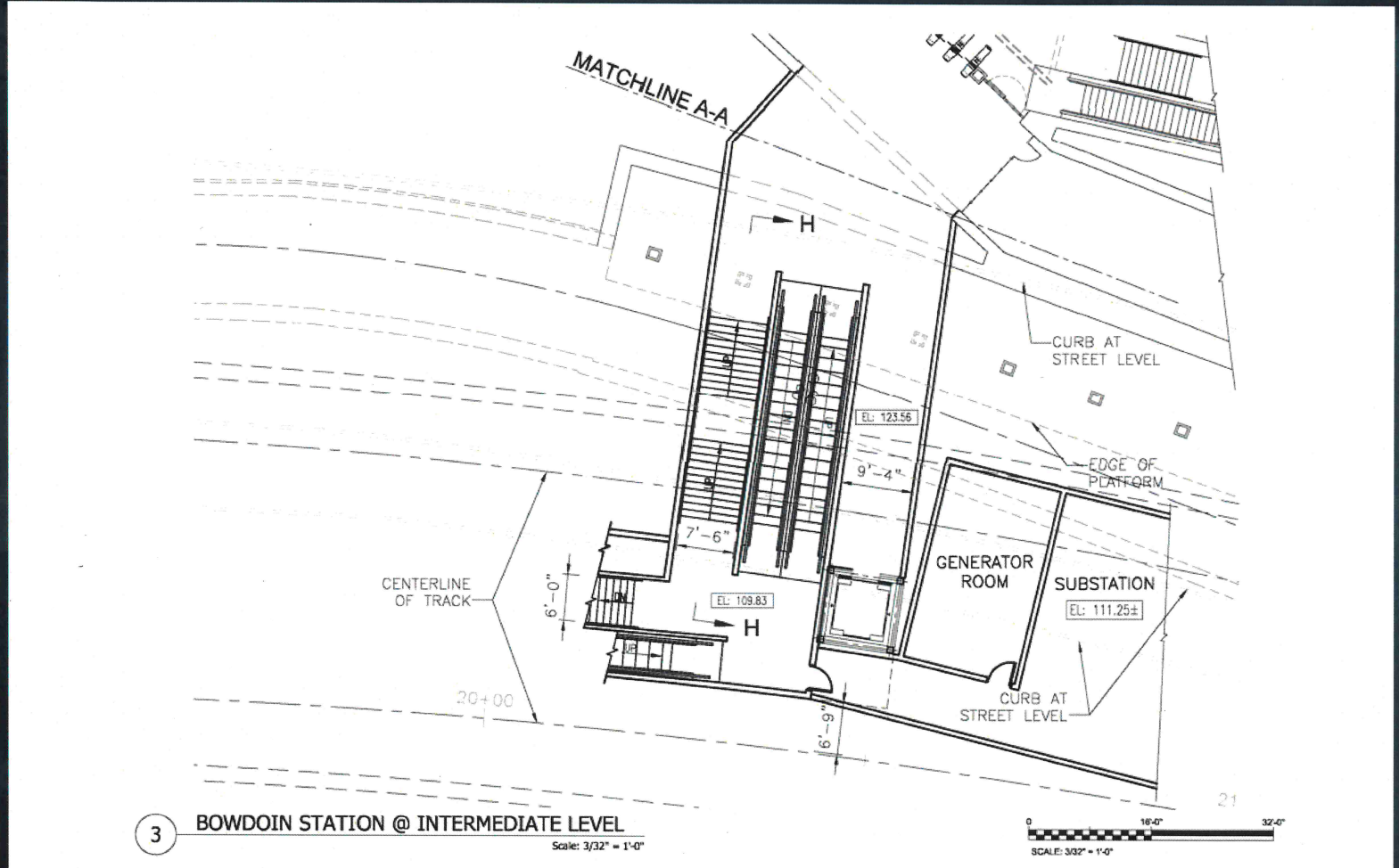
Scale: 3/32" = 1'-0"

0 16'-0" 32'-0"

SCALE: 3/32" = 1'-0"

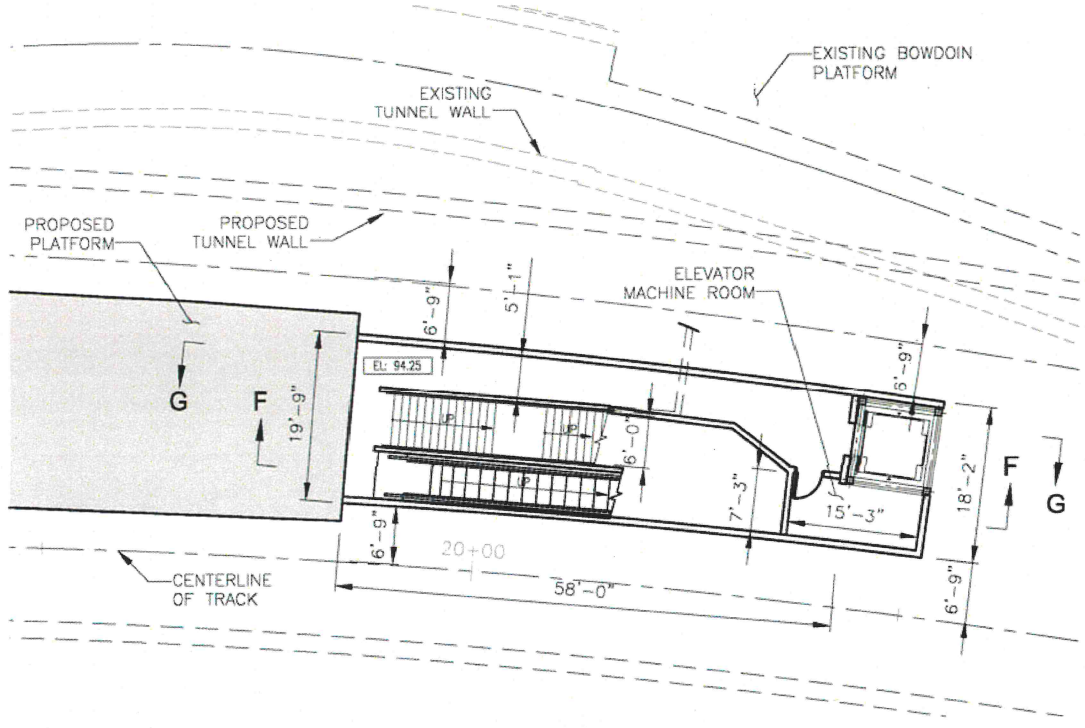
STV

Alternative 2 at Relocated Bowdoin



STV

Alternative 2 at Relocated Bowdoin

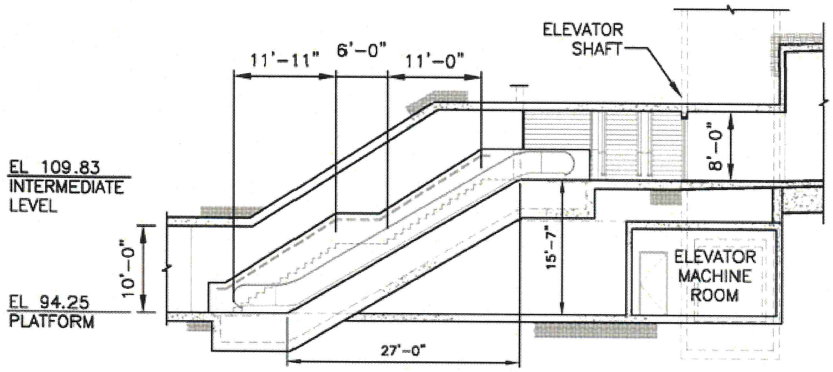


4 BOWDOIN STATION @ PLATFORM LEVEL
Scale: 3/32" = 1'-0"

0 16'-0" 32'-0"
SCALE: 3/32" = 1'-0"

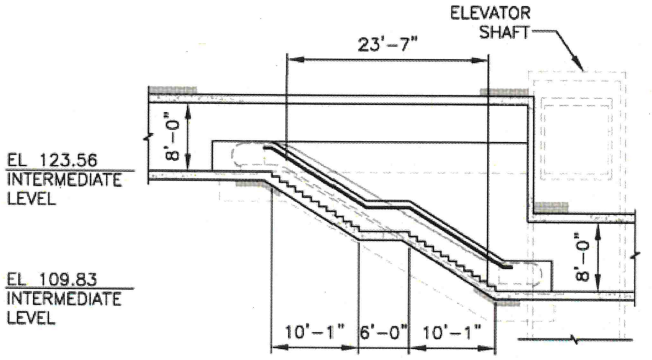
STV

Alternative 2 at Relocated Bowdoin



1 BOWDOIN STATION - STAIRWAY SECTION F

Scale: 3/32" = 1'-0"



2 BOWDOIN STATION - STAIRWAY SECTION H

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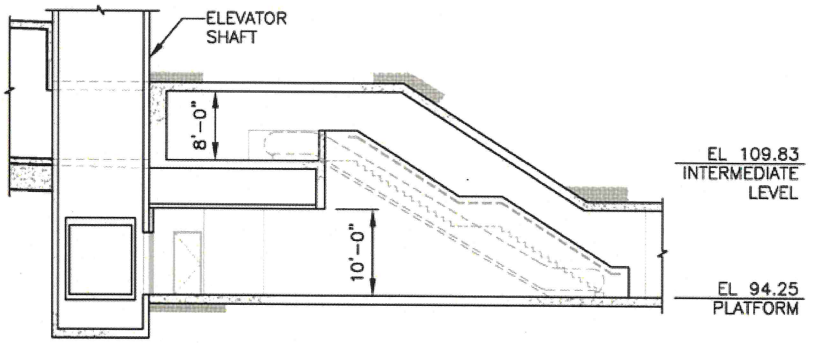
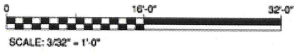


3 BOWDOIN STATION - STAIRWAY SECTION G

Scale: 3/32" = 1'-0"



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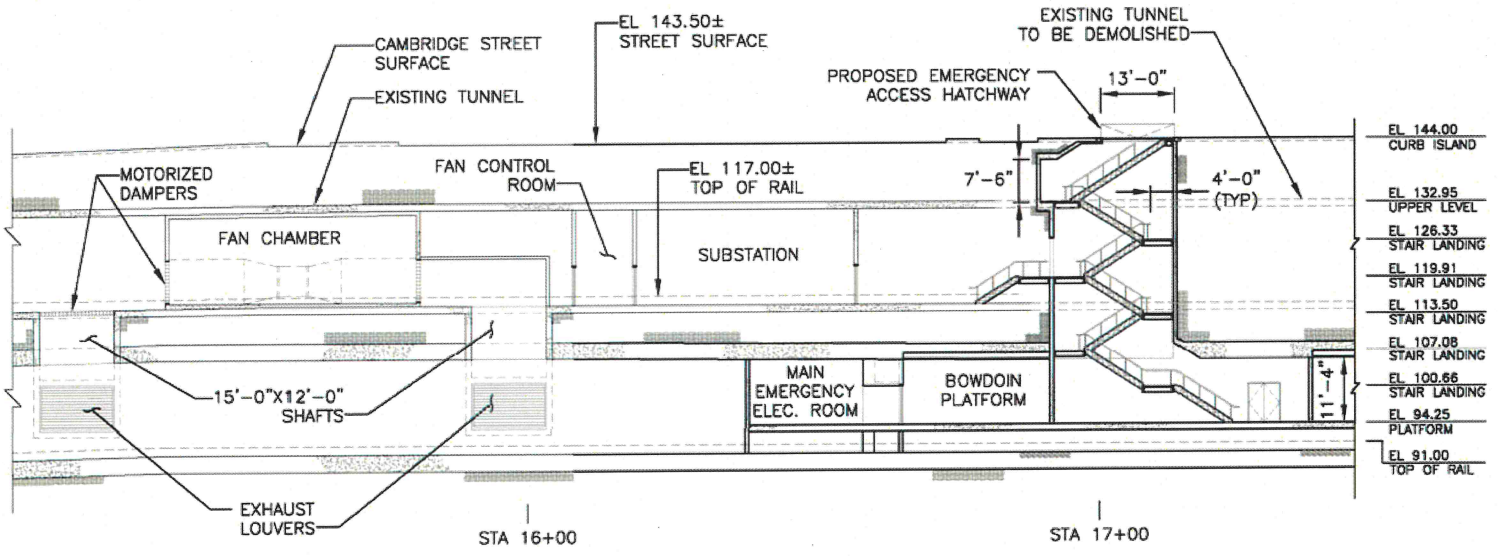
Alternative 2 at Relocated Bowdoin

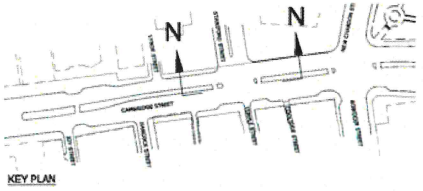


2 VENTILATION ROOM # 2 - SECTION N

Scale: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

SCALE: 1/16" = 1'-0"



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Power, Communications & Signals

Mark Ennis, STV Incorporated

STV

Traction Power

»*Design Submittal:*

- Traction Power Design Criteria
- Typical Diagrams
- Load Flow Study
- Cost Estimates
- Schedules

»*Designs Based on:*

- MBTA Standard Specifications
- Site Surveys
- Previous Projects w/ the MBTA
- Results of Load Flow Study

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Traction Power Systems

- *Traction Power Substation*
- *DC Feeder System*
- *Third Rail*

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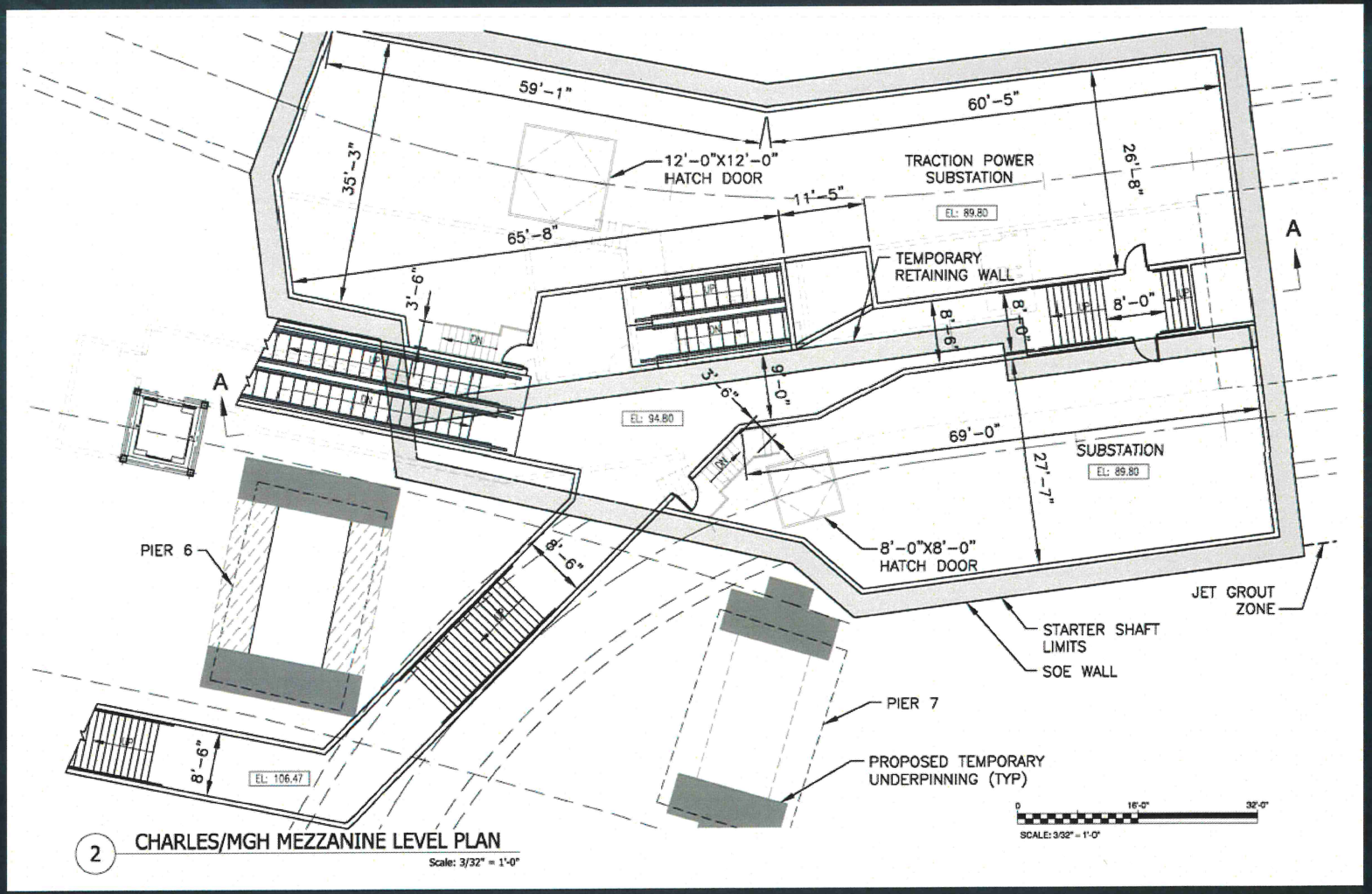
Location of Sub Stations Alt 1&2



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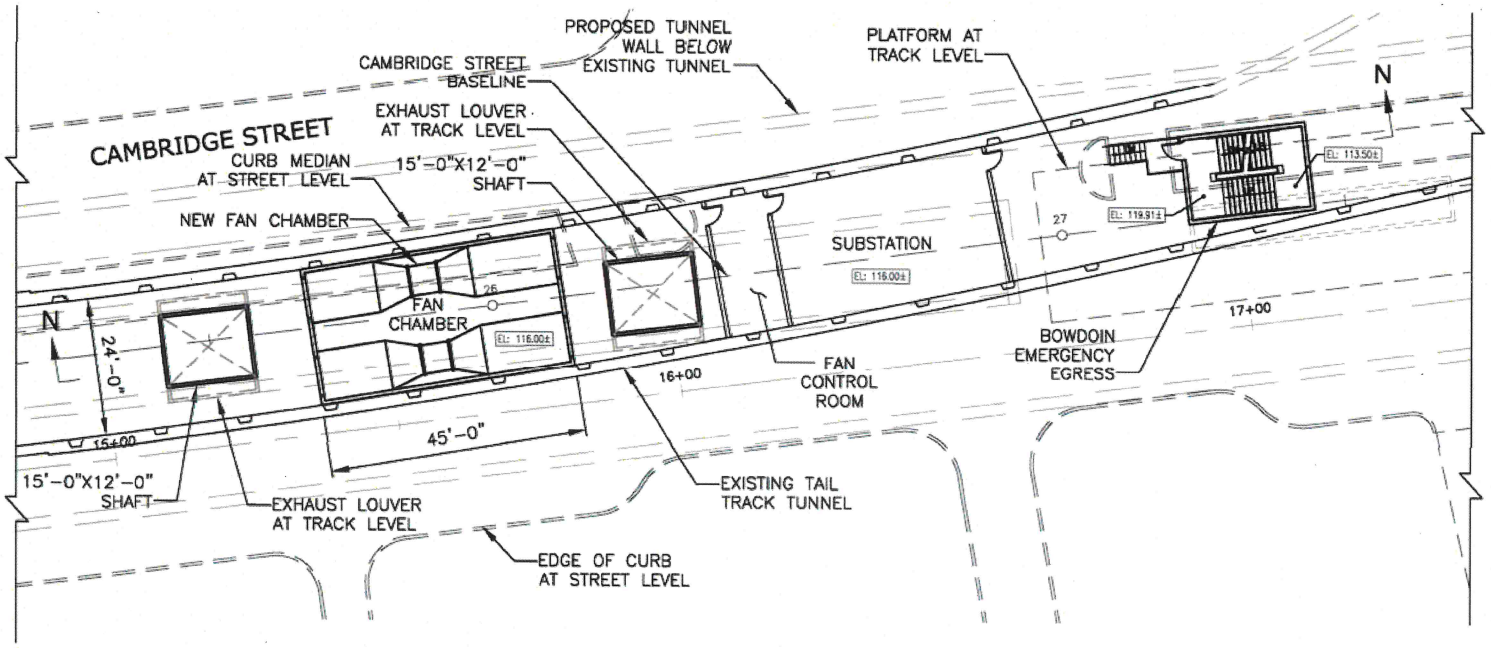
Location of Sub Station –Alt 2



2 VENTILATION ROOM # 2 PLAN BELOW STREET LEVEL

Scale: 1/16" = 1'-0"

0 16'-0" 32'-0"

SCALE: 1/16" = 1'-0"

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Communications System

»*Design Submittal:*

- Communications Systems Design Criteria
- System Block Diagrams
- Cost Estimates
- Schedules

»*Designs Based on:*

- MBTA Standard Specifications
- Site Surveys
- Previous Projects w/ the MBTA

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Communications Systems

- *Network Systems*
  - Wide Area Network (WAN)
  - Local Area Network (LAN)
- *Wireless Systems*
  - Radio
  - Cellular
- *Public Address/Electronic Signage System (PA/ESS)*
- *Telephone System*
  - Wayside Telephone
  - Passenger Assistance Units
- *Security Systems*
  - Closed Circuit Television (CCTV)
  - Access Control Systems
- *Hub Monitoring Control System (HMCS)*
  - SCADA
- *Automatic Fare Control (AFC) System*

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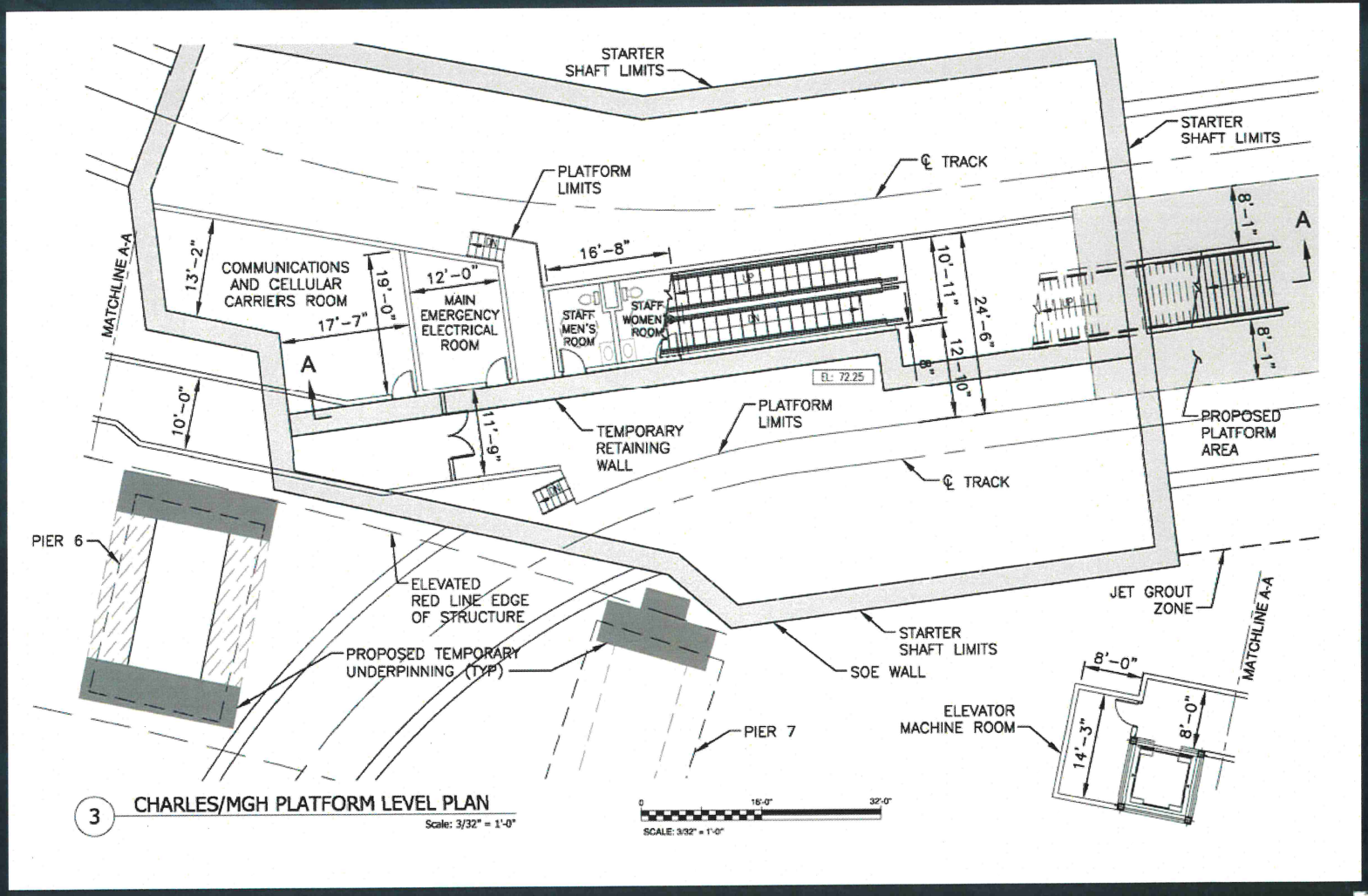
Alt. 1&2 at Charles MGH Blue Line



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Red/Blue Signal Concepts

- Two Major Signal Tasks
  - » *Prepare Government Center as end of line turn back*
    - Two Track Turn back
    - Station to Station Berthing
    - Safe Braking before the Construction Site
  - » *Provide a safe, efficient signal system for the Red/Blue Connector*
    - Safely Control of Trains going into and out of MGH
    - Reduce Wayside Cases
    - Vital Processor Control
    - Integrate with Operations Control Center (OCC)
    - Integrate with Blue Line Fiber Network

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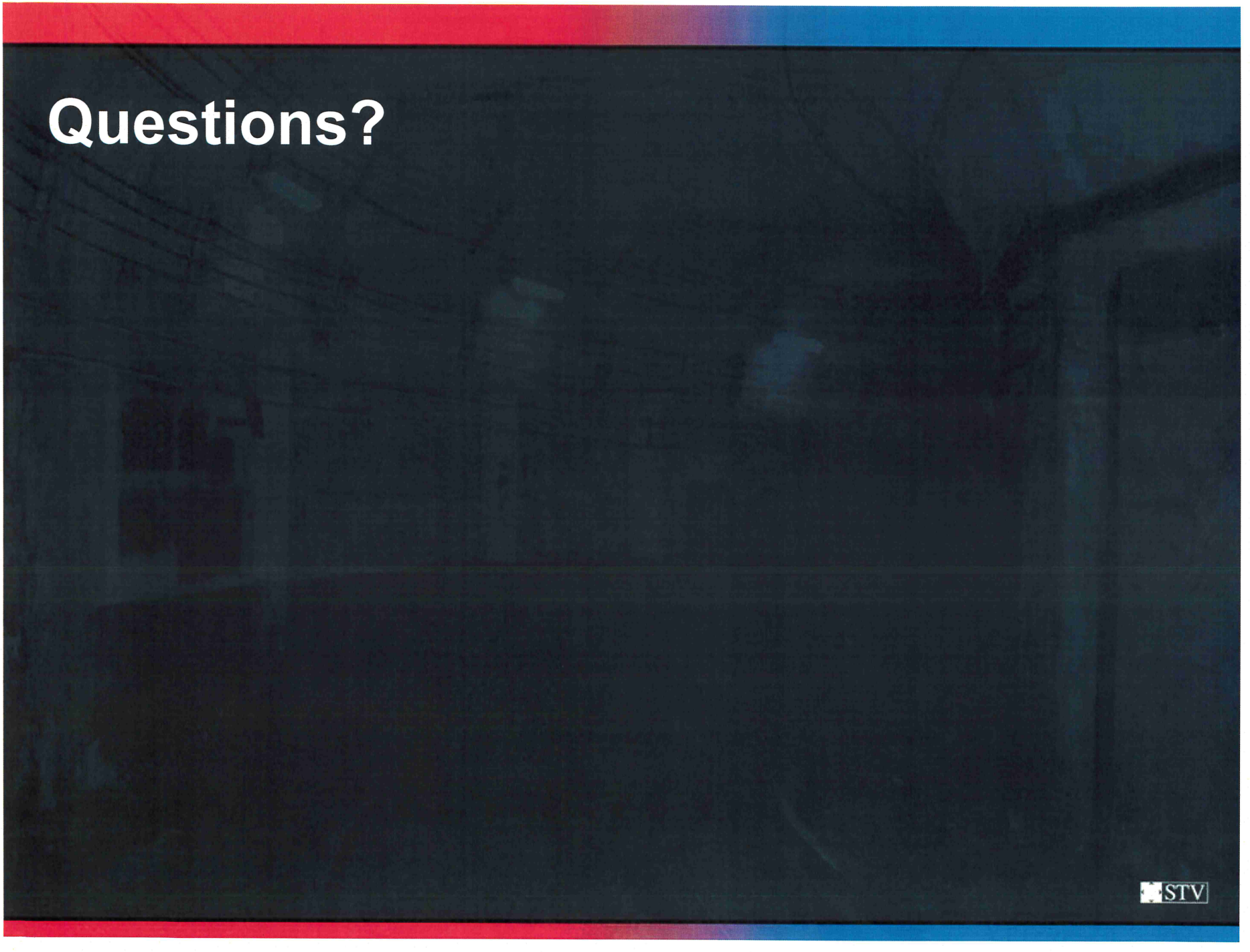
Public Comment?

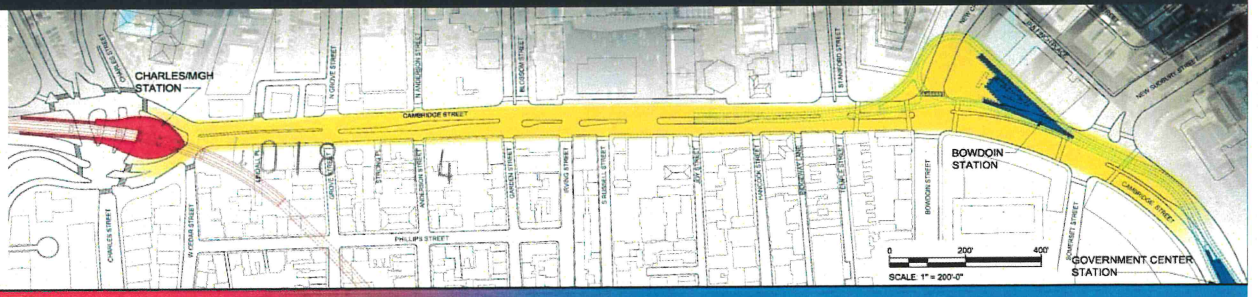
Questions?



Please contact Central Transportation Planning Staff (CTPS) Scott Peterson, 617-973-7078, scottp@ctps.org for information about transportation systems planning.

Please contact public involvement representatives Nancy Farrell or Regan Checchio, 617-357-5772 (nfarrell@reginavilla.com; rchecchio@reginavilla.com). if you would like to arrange a briefing for your organization or neighborhood this fall.

EOT Project Team: Kate Fichter, 617-973-7342, Katherine.Fichter@eot.state.ma.us; Scott Hamwey, 617-973-7210, Scott.Hamwey@eot.state.ma.us

Project background materials, minutes and presentations are posted on this site.

Red Line
Blue Line
CONNECTOR